cc: Leslie

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BEFORE THE BOARD OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

Living Rivers, Petitioner, v. UTAH DIVISION OF OIL, GAS AND MINING, Respondent, RED LEAF RESOURCES, INC., Intervenor-Respondent.	**RED LEAF RESOURCES, INC.'S RESPONSE TO PETITIONER'S REQUEST FOR AGENCY ACTION** Docket No. 2012-017 Cause No. M/047/0103

Pursuant to Utah Admin. Code R641-104-141, Intervenor-Respondent Red Leaf Resources, Inc. ("**RLR**" or "**Red Leaf**"), through its counsel of record, respectfully submits this Response to Petitioner's Request for Agency Action ("**Response**").

JURISDICTION OF THE BOARD

This matter involves the Division of Oil, Gas and Mining's ("**Division's**" or "**DOGM's**") decision to approve Red Leaf's notice of intent to commence large mining operations ("**NOI/LMO**") which is governed by the Utah Mined Land Reclamation Act, Utah Code Ann. § 40-8-13. Contrary to Living River's allegations, the Utah Board of Oil, Gas and Mining

("**Board**") does not have jurisdiction to review the NOI/LMO under the Utah Coal Mining and Reclamation Act, § 40-10-14(3). The Board has jurisdiction to review the Petitioner's Request for Agency Action ("**Request**") in this matter pursuant to the Utah Mined Land Reclamation Act, § 40-8-6 and implementing rule, Utah Admin. Code R. 647-5-106(17), the Utah Administrative Procedures Act, § 63G-4-201, et seq and the Board's rules of practice at Utah Admin. Code R641-100, et seq. In reviewing the reasons for Division's decision, the Board should not attempt to recreate the Division's careful and thorough review of the NOI/LMO. Rather, in most instances it should apply an arbitrary and capricious standard to determine whether there is a "rational connection between the facts found and the choices made by the Division." *See Motor Vehicle Mfrs. Assn. v. State Farm Mutual Auto. Ins. Co.*, 46 U.S. 29, 42 (1983). The Utah courts likewise define the arbitrary and capricious standard of review in administrative proceedings as a test of "reasonableness." *See Sierra Club. v. Air Quality Board,* 2009 UT 76 ¶ 14; *Bourgeous v. Dept. Commerce*, 41 P.3d 461, 463 (Ut. Ct. App. 2002). The standard of review, scope of review and burden of proof will be further addressed in the Respondent-Intervenor's Pre-Hearing Brief.

STANDING OF PETITIONER

RLR denies the allegations of Petitioner that the area within the boundaries of the NOI/LMO is located in a "largely untrammeled area" or that the lands at "the exact site of the proposed Red Leaf Mine" are used as claimed by Petitioner on lands subject to mineral lease and development. Request at ¶ 2. Further, RLR denies the allegation that the Division's decision to approve the NOI/LMO was unlawful, will result in the unlawful contamination of ground water or the environment or will not result in required site reclamation. Request at 2-3; Weisheit Declaration, Exhibit A to Request.

STATEMENT OF FACTS

Red Leaf disagrees with the statement of facts set forth in the Request for Agency Action, and submits the following Statement of Facts as a substitute.

1. Red Leaf is the permittee of the Notice of Intent to Commence Large Mining Operations, Southwest No. 1 Project, approved by the Utah Division of Oil, Gas and Mining as Permit No. M/043/0103 ("**NOI/LMO**").

2. Red Leaf holds oil shale mineral lease numbers ML 50150 and ML 43374 ("**leased premises**") on Utah School and Institutional Trust Lands Administration ("**SITLA**") properties within the NOI/LMO. The mine plan includes 1,318.78 acres within ML 50150 located within Sections 19, 20, 29, 30, Township 13 South, Range 23 East, SLBM, and 320 acres within ML 43374, including lands located in Section 36, Township 13 South, Range 22 East, SLBM.

3. During the time that Red Leaf has occupied the site, Red Leaf personnel have not observed Living Rivers hiking, hunting, stargazing, camping or sightseeing on the leased premises within the NOI/LMO boundaries.

RLR's Exploration, Testing and Pre-Design

4. Prior to obtaining the NOI/LMO, Red Leaf performed process testing and exploration activities in the project area under Exploration Permit No. E/047/1055.

5. On August 9, 2010, a pre-design conference regarding state and local permits required for the Southwest No. 1 Project was held between RLR and key state regulatory agencies, including DOGM and the Utah Division of Water Quality ("**DWQ**").

6. RLR's Exploration Permit was converted to a Small Mining Operation Permit No. S/047/0102 under the Minerals Program in January, 2011, encompassing 4.97 acres for mining, process operations and road access.

7. RLR obtained an additional Exploration Permit No. E/047/0062 from the Division on approximately 3 acres for the Southwest No. 2 Project on March 24, 2011. This area is included in the NOI/LMO.

8. Red Leaf constructed a commercial test facility in October 2008 under its Exploration Permit No. 047/0055, applying its patented EcoShale™ In-Capsule Technology to the mining and development of oil shale. Red Leaf has been in continuous operation since 2008.

9. The NOI/LMO incorporates this technology and expands the scale of RLR's operations to a Large Mining Permit under the Minerals Program. The NOI/LMO meets all of the required elements of the Minerals Program rules at R647-4, et seq. including an approved Operations Plan and Reclamation Plan. RLR has executed a reclamation agreement and posted the required bond with the Division.

NOI/LMO Application Process

10. On April 28, 2011, RLR Submitted the NOI/LMO application to DOGM. The NOI/LMO included an Operations Plan, an Impact Statement and a Reclamation Plan consistent with R647-4 ("**April 28th NOI/LMO**").

11. The April 28th NOI/LMO confirms that there are no plans to have process water discharged from the property. April 28th NOI/LMO at 15.

12. The NOI/LMO Impact Statement addresses projected impacts to groundwater systems and confirms that groundwater is isolated from mining and retorting operations by several hundred feet of low permeability marlstones. April 28th NOI/LMO at 32.

13. On the basis of the August 4, 2010, pre-design conference with RLR, the DWQ was initially satisfied that the Southwest No. 1 Project would not impact groundwater quality. April 28th NOI/LMO, Impact Statement, at 33.

14. In response to the DOGM's technical review letter dated July 20, 2011, as amended, August 3, 2011, RLR submitted to DOGM a Corrected NOI/LMO on September 6, 2011. On September 22, 2011, RLR submitted an Application for Mine Plan Revision or Amendment to replace certain maps and figures. DOGM accepted the modification and new figures on September 27, 2011.

15. By letter dated October 6, 2011, DWQ requested RLR to submit a groundwater discharge permit application for the Southwest No. 1 Mine.

16. RLR submitted to DOGM replacement pages in response to DOGM's initial review of the NOI/LMO. The text on page 33 of the original NOI/LMO was amended to reflect that Red Leaf had interpreted based on the pre-design conference that DWQ was satisfied that the project does not impact water, but confirmed that a formal statement from DWQ is pending (text now appears at NOI/LMO page 42). DOGM accepted the modification on October 17, 2011.

17. On October 20, 2011, DOGM published a Notice of Tentative Approval of the NOI/LMO in accordance with the Division's rules.

18. The Division's Tentative Approval of the NOI/LMO dated October 20, 2011, required RLR, thirty days prior to ground disturbance, to include in the mine plan a "groundwater discharge permit (including a permit by rule) from the Division of Water Quality ("**DWQ**") or a letter saying a permit is not required." (Condition No. 1).

19. By letter dated November 18, 2011, Living Rivers protested DOGM's Tentative Decision to approve the NOI/LMO based on alleged groundwater impacts of the Southwest No. 1 Mine ("**Protest**"). The Protest failed to acknowledge that DOGM's Tentative Approval was expressly conditioned upon DWQ's issuance of a groundwater discharge permit or DWQ's written confirmation that a permit is not required. Protest at p. 3.

20. On December 21, 2011 RLR submitted to DOGM the Utah Ground Water Discharge Permit Application which Red Leaf provided to the DWQ. On January 11, 2012, the DOGM incorporated the Groundwater Discharge Permit Application into the NOI/LMO as Appendix S. The Groundwater Discharge Permit Application is currently pending before the DWQ.

21. On February 24, 2012, an Informal Conference was held by DOGM to address Living Rivers' Protest to DOGM's Tentative Approval of the NOI/LMO.

22. On March 9, 2012, DOGM Director John Baza, Informal Conference Officer, issued Findings of Fact, Conclusions of Law and Order in Cause No. M/047/0103, determining that: (i) the Tentative Conditional Approval dated October 20, 2011, was final; (ii) conditioning approval of the NOI/LMO on Condition #1 requiring that 30 days prior to ground disturbance, RLR provide to DOGM either a groundwater discharge permit or a letter from DWQ stating that

a permit is not required; and (iii) reserving to DOGM enforcement and inspection rights to monitor the Southwest No. 1 Mine to ensure that groundwater is adequately protected in compliance with Condition #1 ("**Final Order**" or "**Findings**").

23. On March 19, 2012, Living Rivers filed a Request for Agency Action seeking Board review of the Division's Final Order.

ARGUMENT

Contrary to the allegations of Living Rivers, DOGM fully considered the groundwater impacts of the Southwest No. 1 Mine as required by the Utah Mined Land Reclamation Program ("**Minerals Program**") and correctly found that the NOI/LMO met the program requirements. Further, the Division appropriately conditioned the NOI/LMO upon DWQ's determination regarding the need for a groundwater discharge permit. Applying the appropriate standard for this administrative review, the Board should find that DOGM had a rational basis for determining that the NOI/LMO met the requirements for approval under the Utah Mined Land Reclamation Act, § 40-8-13 and implementing rules at R647-4, et seq. Further, the Division's decision to approve the NOI/LMO is properly conditioned upon DWQ's deliberations regarding a groundwater discharge permit. RLR requests that the Division's Finding and Order be upheld and that Living Rivers' Request be dismissed.

I. CONTRARY TO LIVING RIVERS' ALLEGATIONS, THE DIVISION'S APPROVAL CONSIDERED THE GROUNDWATER IMPACTS OF THE SOUTHWEST NO. 1 MINE

Living Rivers makes unfounded allegations that the Division's approval of the NOI/LMO was based on a "false assumption" that there will be no impacts to groundwater as a result of the mine. Request at p. 10. The Division relied on no such assumption. In fact, the record shows

that Red Leaf's NOI/LMO provides an adequate description of groundwater resources which meets DOGM's requirements. *See* R647-4-106.8 (depth to groundwater); R647-4-109.1 (narrative description of groundwater impacts). The record shows that DOGM reviewed the NOI/LMO application, and on July 20, 2011 and August 3, 2011, provided detailed comments to Red Leaf regarding their Initial Review, including comments on hydrology and water resources. Findings ¶¶ 24, 25. Red Leaf responded to DOGM's comments with mine plan revisions on September 6, 2011 and September 22, 2011. Findings ¶¶ 26, 27.

Living Rivers makes the blatantly incorrect assertion that there is no evidence in the record that "the Division factored in the DWQ's decision to require RLR to submit an application for a groundwater discharge permit." Request at 11; note 1. The allegation is both false and meaningless. Living Rivers cannot show that "factoring" the DWQ process with the DOGM permit decision would lead to a different outcome, or result in compliance with any legal requirement that would otherwise be evaded. Contrary to Living Rivers' allegations, the record shows that both DOGM and Red Leaf responded to DWQ's October 6, 2011 decision to require Red Leaf to submit an application for a groundwater discharge permit. Red Leaf modified the NOI/LMO application on October 7, 2011 to reflect this request. Findings ¶ 30

Further, the Division specifically conditioned its permission to operate under the NOI/LMO upon the issuance of a groundwater discharge permit by the DWQ or a letter stating that a permit is not required. *See* Condition #1, Conditional Tentative Approval, dated October 20, 2011, attached as **Exhibit A**. On December 21, 2011, Red Leaf provided DOGM with a copy of the groundwater discharge application which it provided to DWQ. Findings ¶ 44. As noted by the Hearing Officer in the Informal Conference, this application was incorporated into the NOI/LMO as Appendix "S" prior to DOGM's final approval of the NOI/LMO. Findings

¶¶ 44–45. The Division's Final Order dated March 9, 2012, is also explicitly conditioned upon DWQ's approval of a groundwater discharge permit or confirmation that a permit is unnecessary. Final Order ¶ 2.

The Division acted well within its authority by conditioning the NOI/LMO upon DWQ's approval of a groundwater discharge permit. The Minerals Program specifically provides that the NOI/LMO does not relieve the applicant of the obligation to comply with all applicable statues, rules and regulations including those of the DEQ. Utah Code 40-8-17(i); R647-1-102.3. Imposing such a condition, therefore, is within the discretion afforded to both the Division and Board to administer the Minerals Program, and will be affirmed upon judicial review so long as the decision is reasonable. *See* Utah Code § 63G-4-403(4)(h); *Sierra Club v. Air Quality Bd.*, 2009 UT 76, 226 P.3d 719 at ¶ 14.

In this case, conditioning the commencement of surface disturbance at the mine site upon DWQ's groundwater discharge permitting decision is entirely reasonable. This approach insures that both agencies act within their areas of authority, and apply all statutory provisions, before any disturbance occurs. Further, conditioning the NOI/LMO upon DWQ's permit is consistent with the Memorandum of Understanding between DOGM and DWQ, dated September 1, 1999 ("**MOU**"). Consistent with the MOU, a pre-design conference was held in August, 2010, which included RLR, DWQ and DOGM. MOU, Article III.A. RLR believed, based on that meeting, that a groundwater discharge permit application was not required by DWQ. April 28th NOI/LMO at p. 33. However, in October, 2011, RLR was required to submit a groundwater permit discharge application. DWQ letter dated October 6, 2011. DWQ and DOGM are now coordinating their separate permitting responsibilities to avoid duplication. *See* MOU Article III.B.5. Consistent with the MOU, DWQ is should keep DOGM advised of notices regarding the

groundwater discharge permit application and provide DOGM with a copy of the final permit. MOU Article III.B.6. For its part, the Division has agreed to condition the NOI/LMO upon DWQ's permitting decision.

Living Rivers' complaint that the DWQ groundwater permit discharge application was submitted after the Division's tentative decision is of no consequence. Prior to issuing a final decision on the NOI/LMO the Division provided Living Rivers will a full opportunity at an Informal Conference in February, 2012, to advise the Division of any issues or concerns, relative to the NOI/LMO that might warrant further investigation or review. Living Rivers has also met with DWQ and has provided DWQ with written comment on RLR's groundwater discharge permit application. Living Rivers, through this hearing, now has an opportunity to fully explore the groundwater impacts of the NOI/LMO before the Board. Red Leaf believes that those issues should be brought forward and heard without further delay pending DWQ's review of the groundwater discharge permit. The permitting processes of the Division and DWQ are independent and Red Leaf sees neither wisdom nor value in the delay and this hearing until DWQ issues its decision on the groundwater discharge permit.

II. THE NOI/LMO ADEQUATELY ACCOUNTS FOR LOCAL GROUNDWATER RESOURCES

A. Description of Groundwater Resources; Depth to Groundwater

Contrary to Living Rivers' allegations, the NOI/LMO for the Southwest No. 1 Project provides an adequate description of groundwater resources to meet the requirements of R647-4-106.8. *See* NOI/LMO III.106.8, Depth to Groundwater at pp. 37-38, attached as **Exhibit B**. RLR also met the requirements of R647-4-109 by providing a narrative description of groundwater impacts. *See* NOI/LMO IV.109.1: Projected Impacts to Surface and Groundwater

Systems at pp. 40-42, attached as **Exhibit C**. In addition, groundwater resources are fully described in RLR's groundwater discharge permit application dated December 20, 2011 and incorporated into the NOI/LMO. *See* NOI/LMO Appendix "S," attached as **Exhibit D** (full text on file with Board Docket Secretary). The Division correctly found that RLR's NOI/LMO meets the requirements of R647-4-106(8) and R647-4-105; 1.12 and R647-4-109. Findings, ¶¶35, 36, 41.

The administrative record shows that the Division considered the records of the State Engineer in reviewing the NOI/LMO application. The Executive Summary of the NOI/LMO confirms that records of nearby water wells retained by the Utah Division of Water Rights ("**DWR**") reflect two deep isolated perched aquifers at: (a) in a 1312 foot deep well at 475 feet (9gpm) and (b) in a 1360 foot deep well. Executive Summary dated October 5, 2011, attached as **Exhibit E**; NOI/LMO p. 38. Findings, ¶¶ 40, 41. The Division further concludes that groundwater is not susceptible to mining operations because it is isolated by several hundred feet of low permeability marlstone. Executive Summary, at p. 2; Findings, ¶¶ 40, 41. The Division's Findings from the Informal Conference also establish that the Division confirmed the depth to groundwater via a geologic map and U.S. Geological Survey ("**USGS**") report. Finding ¶ 35.

The observed depth to groundwater is consistent with data from other wells in the general area (set forth at Table 1, p, 18-19, Groundwater Discharge Permit Application), and with published reports described in the NOI/LMO and the Findings. *See* NOI/LMO, Appendix S, attached as **Exhibit F**. Finding, ¶ 35. The Division correctly found that this information satisfies the explicit requirements of R647-4-106(8) and R647-4-109. Findings, ¶¶ 35, 41.

B. Parachute Creek and Douglas Creek Formations

The Division appropriately found that the NOI/LMO contains an adequate analysis of the Parachute Creek and Douglas Creek members of the Green River Formation. *See* Hydrogeology Report, NOI/LMO, Appendix S, p. 13, attached as **Exhibit G**. Findings, ¶¶ 41, 33, 34, 35. The NOI/LMO reports no USGS-mapped springs issuing from these formations. Contrary to Living Rivers' allegations, the Division testified at the Informal Conference that a more detailed seep and spring inventory is not required by the Minerals Program rules and that the USGS maps of seeps and springs were acceptable. Findings ¶ 36. However, in addition, RLR identifies water sources within a one-mile radius of the mine operations at Figure 3, Appendix S, groundwater discharge permit application, attached as **Exhibit H**. This Application was part of the administrative record when the Final Order was entered. Findings, ¶¶ 44, 45.

Responding to Living Rivers' allegations, Red Leaf clarified at the Informal Conference that RLR had encountered an insignificant amount of groundwater in drilling its six exploration core holes. The Groundwater Application shows that water was encountered during drilling in one hole, RL-1, which is the southern-most hole drilled (Figure 6) attached as **Exhibit I**. Hole RL-1 was drilled at the head of a small draw and the water was encountered in fractures near the top of the hole. No water was encountered at depth in RL-1 or in any of the other holes. It should be noted that core holes are drilled with water as a circulation medium. Small quantities of water might not be observed; however, any significant water-bearing horizon would be recognized by an increase in circulation rate (return of water to the surface). The results of RLR's exploration drilling are summarized in the NOI/LMO, and the full well logs are set forth at Figure 6 of the Groundwater Quality Discharge Application, Appendix "S," attached as

Exhibit I. The record shows that the Division was aware of this information prior to issuing its final decision approving the NOI/LMO. Findings, ¶ 45.

Finally, the NOI/LMO provides a summary of nearby water wells on file with the Utah Division of Water Rights, Appendix S, p. 21, attached as **Exhibit K**. Findings, ¶ 45. Contrary to the allegations of Living Rivers, the location of these wells is clearly identified in the State Engineer's database for each water well.

Based on the information in the record, including that presented at the Informal Conference, it was reasonable for the Division, through its Hearing Officer, to conclude that this information meets the requirements of R647-4-106(8) and R645-4-109. At the hearing before the Board, Living Rivers will have the burden of proving that the Division's determination fell outside the bounds of rational decisionmaking. Red Leaf believes that the Hearing Officer acted reasonably, and that the Board should uphold the Division's final decision conditionally approving the NOI/LMO.

III. THE NOI/LMO ADEQUATELY ACCOUNTS FOR POTENTIAL IMPACTS TO GROUNDWATER RESOURCES

The Division appropriately considered data set forth in the NOI/LMO confirming that groundwater is isolated from RLR's operations by several hundred feet of low permeability marlstone. Finding # 39; October 5, 2011 Executive Summary attached as **Exhibit E**. *See* the NOI/LMO at p. 42 attached as **Exhibit J**.

Living Rivers cites the NOI/LMO for the statement that the first porous unit occurs some 50-100 feet below the Mahogany zone. Actually, the NOI/LMO cites Holmes and Kimble regarding the occurrence of sandstone units comprising the top of the Douglas Creek Member of the Green River Formation. NOI/LMO at p. 42, attached as **Exhibit J**. However, the NOI/LMO

also states that vertical permeability throughout the formation is restricted to jointing, an infrequent occurrence. *Id.* at 42. RLR found no evidence of significant groundwater resources in this area and Living Rivers presents no independent evidence in support of its allegations. The Division's acceptance of this description was reasonable because all of the hydrologic evidence, individually, supported the conclusion. Collectively, it leads reasonably to the conclusion that the groundwater resource is adequately described as "insignificant." Living Rivers presented no contradictory evidence at the Informal Conference, and the Findings accept the evidence as sufficient to support their description. Findings ¶¶ 33–37, 50–54. Therefore, the Division's final decision approving the NOI/LMO should be upheld.

IV. THE NOI/LMO PROVIDES ADEQUATE EVIDENCE TO SHOW THAT THE ECOSHALE™ IN-CAPSULE DESIGN WILL PREVENT CONTAMINATION OF LOCAL GROUNDWATER RESOURCES

The NOI/LMO provides adequate information to meet the requirements of R647-4-106(8) and R647-4-109(1). Contrary to the assertions of Living Rivers, the Utah Minerals Program does not require RLR to provide a Failure Modes and Effects Analysis or an adaptive management plan as a condition to obtaining an approved NOI/LMO.

RLR adequately addressed the structural integrity of the EcoShale™ In-Capsule design to the satisfaction of the Division. *See* RLR's letter to the Division dated November 28, 2011, attached as **Exhibit L**. In addition, at the Informal Conference, RLR addressed Norwest's Geotechnical Analysis dated April 21, 2011, Attachment I to the NOI/LMO. The Norwest Analysis focused specifically on the stability of backing walls of the capsules. Norwest recommended that the effects of retorting on the backing wall and BAS be evaluated thoroughly as capsule design continued. RLR considered Norwest's recommendations in the design set

forth in revisions to the NOI/LMO, submitted to the Division on September 22, 2011. The revised NOI/LMO addresses the issues raised in the Norwest Analysis dated April 21, 2011.

The major elements of capsule design are also addressed in the groundwater discharge permit application on file with DWQ. *See* §§ 11, 12, 13, Groundwater Discharge Permit, NOI/LMO, Appendix S, pp. 25-40. Red Leaf confirmed in correspondence to the Division that this design will be further assured by RLR's proposed monitoring plan. RLR letter to the division dated November 28, 2011, attached as **Exhibit L**. Moreover, RLR agreed to adhere to all reclamation requirements and revegetation requirements as indicated in its NOI/LMO and reclamation contract. *Id.*

RLR's pre-production Quality Assurance and Quality Control ("**QA/QC**") plan specifies testing procedures for design and construction of the EcoShale™ In-Capsule Process. NOI/LMO, Appendix S, § 12, pp. 33-35. Red Leaf addressed this plan at the Informal Conference. The QA/QC Plan includes testing procedures for determining the integrity of the installed Bentonite-Amended Soil ("**BAS**") layer to assure construction of the capsule shell at a hydraulic conductivity of 10^{-7} cm/sec, a commitment of the NOI/LMO. As stated in its application, the BAS layer will provide a seal such that the process capsule is "impermeable" and in compliance with RLR's NOI/LMO commitments. Finding, ¶ 41. RLR's QA/QC plan is also addressed in the DWQ groundwater discharge permit application. NOI/LMO, Appendix S. *Id.*

Living Rivers' assertions regarding the Eco-Shale Capsule design are at odds with the evidence in the record, and contradicted by the Division's Findings from the Informal Conference. Findings ¶¶ 39–41. At the hearing before the Board, Living Rivers will have the burden of proving that these Findings are incorrect.

CONCLUSION

In sum, the Division correctly and reasonably determined that RLR's NOI/LMO application fulfills all of the requirements of the applicable Division rules and regulations under the Minerals Program. Living Rivers' Request for Agency Action fails to allege that any finding of fact is incorrect, that any Division conclusion resting upon these findings is unreasonable, or that any conclusion of law is incorrect. Accordingly, RLR urges the Board to uphold the Division's final decision approving the NOI/LMO.

RESPECTFULLY SUBMITTED this 17th day of April, 2012.

SNELL & WILMER

Denise A. Dragoo
James P. Allen
Stewart O. Peay
Attorneys for Red Leaf Resources, Inc.

CERTIFICATE OF SERVICE

I hereby certify that on the 17th day of April, 2012, a true and correct copy of the foregoing RED LEAF RESOURCES, INC.'S RESPONSE TO PETITIONER'S REQUEST FOR AGENCY ACTION was served by e-mail and on the 18th day of April, 2012, will be hand delivered to the following:

Jaro Walker
Charles R. Dubuc
Western Resource Advocates
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Salt Lake City, Utah 84102

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Salt Lake City, Utah 84116

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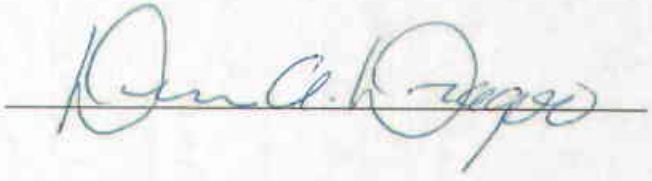

EXHIBIT A

GARY R. HERBERT
Governor
GREGORY S. BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

October 20, 2011

James Patten
Red Leaf Resources, Inc.
200 West Civic Center Drive, Suite 190
Sandy, Utah 84070

Subject: Conditional Tentative Approval to Commence Large Mining Red Leaf Resources, Southwest #1, M/047/0103, Uintah County, Utah

Dear Dr. Patten:

The Division of Oil, Gas and Mining has completed a review of your latest response regarding the referenced Notice of Intention to Commence Large Mining Operations (Notice), received October 7, 2011. The Division tentatively approves the Notice for the Southwest #1 mine, with the condition outlined below.

Condition 1:

Thirty days (30) prior to ground disturbance, please include in the plan either a groundwater discharge permit (including a permit by rule) from the Utah Division of Water Quality (DWQ), or a letter saying a permit is not required.

The notice of tentative approval will be published in the appropriate Salt Lake City and Uintah County newspapers. This will begin a 30-day public comment period. The Division will also notify the Resource Development Coordinating Committee (RDCC). If no substantive comments are received during the public comment period, the Division will then issue its final approval for this project. Changes to the Notice may be needed if substantive comments are received.

Prior to issuing final approval, we require that you provide us with:

1. Two copies of the complete and corrected plan. When final approval is issued, one copy will be stamped "approved" and returned to you for your records. You may desire to update the copies of the plan the Division has already received.

1594 West North Temple, Suite 1210, PO Box 145801, Salt Lake City, UT 84114-5801
telephone (801) 538-5340 • facsimile (801) 359-3940 • TTY (801) 538-7458 • www.ogm.utah.gov

UTAH DNR OIL, GAS & MINING

2. A Reclamation Contract (Form MR-RC) and reclamation surety in the amount of $3,776,000. Please contact Penny Berry at 801-538-5291 or by e mail at bondcoordinator@utah.gov to obtain the appropriate bond and reclamation contract forms.
3. If available, an electronic copy of the mine disturbed area in the original autocad, shape, or other file format. Please include the projection and datum information with this file. Contact danielsmith@utah.gov, (801)538-5292 for further information or questions.

Thank you for your cooperation and patience in completing this permitting process. If you have any questions regarding this letter, please contact me at 801-538-5261 or Leslie Heppler at 538-5257.

Sincerely,

Paul B. Baker
Minerals Program Manager

PBB:eb
cc: SITLA- JBlake@utah.gov
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BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---ooOoo---

IN THE MATTER OF TENTATIVE DECISION TO APPROVE A NOTICE OF INTENTION TO COMMENCE LARGE MINING OPERATIONS FOR THE RED LEAF RESOURCES, SOUTHWEST #1 MINE UINTAH COUNTY, UTAH	:	NOTICE OF TENTATIVE DECISION TO APPROVE M/047/0103

---ooOoo---

Notice is hereby given by the Division of Oil, Gas and Mining of its tentative decision to approve the Notice of Intention to Commence Large mining Operations for the Southwest #1 mine. Mining activities will affect the following area: Sections 19, 29, and 30, Township 13 South, Range 23 East, and Sections 25 and 36, Township 13 South, Range 22 East, SLBM., Uintah County, Utah.

Any person or agency aggrieved by this tentative decision may file a written protest within thirty (30) days of the date of publication to Dana Dean, P.E., Associate Director of Mining, Division of Oil, Gas and Mining, 1594 West North Temple, Suite 1210, Box 145801, Salt Lake City, Utah 84114-5801, setting forth factual reasons for the complaint.

DATED THIS 20th day of October, 2011

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

Dana Dean, P.E.
Associate Director, Mining

CERTIFICATE OF MAILING

I hereby certify that I caused a true and correct copy of the foregoing Notice of Tentative Decision to Approve the Large Mining Notice of Intention for Red Leaf Resources. Southwest #1 M/047/0103 to be sent via facsimile, electronic mail, or mailed by first class mail, postage prepaid, the 20th day of October, 2011 to:

FACSIMILE: 801-257-8525
E-MAIL: naclegal@mediaoneutah.com

Salt Lake Tribune
Legal Department
90 South 400 West, Suite 700
Salt Lake City, Utah 84101

FACSIMILE: 435-789-8690
EMAIL: classifieds@vernal.com

Vernal Express
54 North Vernal Ave
PO Box 1000
Vernal, Utah 84078-1000

CERTIFIED RETURN RECEIPT
7004 1160 0003 0191 8595

Dr James Patten
Red Leaf Resources
200 West Civic Center Drive, Suite 190
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CERTIFIED RETURN RECEIPT
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John Blake
SITLA
675 East 500 South, Suite 500
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CERTIFIED RETURN RECEIPT
7004 1160 0003 0191 8618

Matt Cazier
Uintah County Planning and Zoning
152 East 100 North
Vernal, Utah 84078

Emily Berry, Secretary
M/047/0103

EXHIBIT B

106.8: Depth of Groundwater, Extent of Overburden Material and Geologic Setting

Groundwater

Mesozoic-age rock underlies much of the upper Colorado River basin, including the Uintah Basin. Several aquifers of regional extent are found within these rocks (Freethey and Cordy 1991). Groundwater associated with the Mesa Verde Group is the uppermost of these larger aquifers. Within the Uintah Basin, the saturated thickness associated with this aquifer often well exceeds 2,000 feet in thickness, but is buried quite deep (Freethey and Cordy 1991). Based on Utah Division of Oil, Gas and Mining (DOGM) records of oil and gas wells near the Red Leaf project site, the top of the Mesa Verde Formation is between 3,000 and 4,000 feet below ground surface (as indicated for APIs 43-047-37522, 43-047-36729, 43-047-30386, 43-047-15924, 43-047-11139 (DOGM 2010b).

However, in the general vicinity of the Red Leaf project, groundwater is generally found at depths shallower than the above-reported formation depths (Price and Miller 1975, Utah Division of Water Rights 2010), reflecting either the higher potentiometric surface associated with the deep artesian aquifer or more localized shallower groundwater. In this area, the Green River and Wasatch Formations overlie the Mesa Verde Group; alluvial deposits are minimal in the Red Leaf parcels and are insufficient to support groundwater. The Parachute Creek Member of the Green River Formation is the surface bedrock formation found throughout the majority of the two Red Leaf parcels (Sprinkel 2007). The Parachute Creek Member contains the Mahogany Oil Shale zone, from which Red Leaf would extract its raw ore. The Douglas Creek Member of the Green River Formation crops out in some of the deeper canyons in and near the two parcels (Sprinkel 2007). The project geology is shown on **FIGURE 17.**

State and federal publications (Price and Miller 1975; Howells, Longson & Hunt 1987; Sprinkel 2007) describe the Green River, Wasatch, Mesa Verde and formations as intermixed strata of sandstone, shale, siltstone, and mudstone, with permeabilities ranging from very low to high. While the Green River Formation is generally considered an aquiclude, with low spring and well yields (Price and Miller 1975), the BLM (2007) considers both the Parachute Creek and Douglas

Creek members as key aquifers in the general Uintah Basin area. Price and Miller (1975) report low permeability for the Wasatch Formation, and spring yields that are somewhat greater than those issuing from the Green River Formation.

Price Miller data was based on surface data but recent, actual sub-surface data acquired as part of Red Leaf's activities results in updated data that differs somewhat form Price and Miller. Given the positions of the Parachute Creek and Douglas Creek members within the Red Leaf parcels specifically, they are unlikely to contain significant quantities of groundwater, though its presence in these rocks cannot be ruled out. However, there are no USGS-mapped springs issuing from either of these members in or near the parcels, and exploration drilling by Red Leaf did not encounter groundwater. Records of nearby water wells on file with the Utah Division of Water Rights (2010) indicate the following:

1. A 500-foot-deep well was abandoned during year 2004 drilling due to a lack of water.
2. A 1,312-foot-deep well drilled in 1978 had a static water level of 475 feet and produced at a rate of 9 gallons per minute during a pump test.
3. A 1,360-foot-deep well, for which no static water level information is available, produces 17-plus gallons per minute, based upon a Proof submitted in 2009.
4. A 900-foot-deep well drilled in 2010 and in operation in 2011, produces up to 20 gallons-per-minute during pump test, and operated at 15 gallons per minute (Red Leaf well).

On a regional basis, direction of groundwater movement in this part of the Uintah Basin is toward the North. Water quality ranges from relatively good to briny, with a range between 1,000 mg/L and 3,000 mg/L total dissolved solids expected in the aquifer underlying the Red Leaf project (Price and Miller 1975).

Extent of Overburden Material and Geologic Setting

The overburden material consists of competent layers of shale, oil shale (lean horizons), marlstone, siltstone, and tuffs belonging to the Parachute Creek Member of the Green River Formation. The strata forms flat-lying layers of rock within the permit area. The strata dips

EXHIBIT C

IV. R647-4-107 Operation Practices

Operation Practices will be consistent with the procedures described in this plan. (See "Operations Practices" provided in **APPENDIX Q.**

V. R647-4-108 Hole Plugging Requirements

If any additional exploration holes are drilled, they will be plugged and abandoned according to applicable regulations.

VI. R647-4-109 Impact Statement

109.1: Projected Impacts to Surface and Groundwater Systems

The project area is characterized by ephemeral/intermittent steam channels (usually dry with the exception of occasional snow runoff and summer storm events), a pinyon-juniper vegetation community, and well-drained silty loam soils with a rated permeability of 2-6 in/hr (NRCS, 2003). The soils are classified as hydrologic soil type B. Plant cover within the project area mainly consists of pinyon pine, juniper, greasewood, sagebrush, and mixed grass species.

Annual rainfall is generally low for this region. It averages 10 in. per year (NRCS, 2010). The 10-year 24-hour storm event for the project area is 1.68 in.. Precipitation data, soil and plant cover information were used to design the surface drainage control system. From the project area, surface water flows from Reservoir Canyon and unnamed ephemeral/intermitten drainage

channels and arroyos to Indian Ridge Canyon, tributary to Sweetwater Canyon, a tributary to Bitter Creek, which in turn flows northeast into the White River, a tributary of the Green River (**FIGURE 14** Surface Water Resource Map). Due to the ephemeral nature of the receiving waters near the project site, available water quality information is limited. Regional surface water data is available from USGS Site 09306780, *Sweetwater Canyon Creek near Mouth near Watson, Utah*, and was collected between October 1, 1974 and October 5, 1978. This USGS Site is on the Sweetwater Canyon drainage and is located upstream of the confluence of this drainage with the ephemeral/intermittent Reservoir Canyon or the unnamed side drainage of Indian Ridge Canyon, whose headwaters are within the project area. The USGS Site is only 3.35 miles away from the project area as the crow flies. The USGS Site has a drainage area of 124 square miles, significantly larger than watersheds in the permit area. Flow data was collected between October 1974 and October 1978. The monthly average flow in June and August through January is zero. A maximum flow of 9.4 cfs was observed during the monitoring period and occurred on July 25, 1976.

Best management practices and concurrent reclamation activities will be implemented during the life of mine operations to ensure protection of surface water resources. To prevent impacts to surface water resources and minimize erosion potential, a series of clean water diversions and sumps will be constructed to manage runoff at the project site. Sizing is based on best engineering practices, and includes storage in the clean water sumps resulting from the 10 year 24-hour storm event predicted run-off from the upstream contributing watershed. Spillways are always sized for larger storm events than the pond capacity to protect the embankment, and the emergency spillway can safely pass the 100-year 24-hour storm event. Excavation is planned to first occur at the southwest corner of the mine and move northward into Section 19 T 13S R 23E. Later mining will occur in Section 36 T 13S R 22E. Clean water diversions are also sized to handle the 100-year 24-hour storm event from the upstream contributing watershed with 0.5 feet of freeboard. Use of this storm design event minimizes risk to the active pit areas and includes capacity for sediment deposition. Water management structures will be in place prior to any earth disturbing activities. During the reclamation phase, ponds and perimeter ditches will be constructed on site within the lease boundaries to control and contain runoff from the site after mining operations cease. Anticipated impacts to the adjacent surface waters are minimal because

much of the project's extraction and reclamation activities are conducted below grade and any potential run-on will be redirected into diversions and storage ponds. It is anticipated that downstream drainages will not be impacted by mining activities. A detailed Drainage Control Plan that describes the design of all measures is provided as **APPENDIX E** of this application.

Groundwater is not susceptible to any impacts from the mining and retorting operations because it is isolated from those operations by several hundred feet of low permeability marlstones. While the B-groove can be a water-bearing interval in other areas such as the Piceance Basin in Colorado, the B-groove in the Uinta Basin at the bottom of the Mahogany Zone is unsaturated in this area. The first potential porous unit occurs approximately 50-100' below the Mahogany zone, which are sandstone making the top of the Douglas Creek Member of the Green River Formation, described by Holmes and Kimball. Vertical permeability through the Green River Formation is restricted to jointing, which is limited even in outcrop, and infrequent below the mantle of weathering. Classic dikes in the oil shale section described by Donnell in the east margin of the basin have not been observed in the Kimball Creek area.

Water Resources

Surface Water Quality

There are no perennial water sources within the project area, so there is no information on surface water quality.

Groundwater Quality

Based on pre design conference review, Red Leaf interprets that the Division of Water Quality (DWQ) is satisfied that the project does not impact water. A formal statement from DWQ is pending. The formal letter submitted to DWQ by JBR Environmental Consultants on behalf of Red Leaf Resources is provided as **APPENDIX N.**

EXHIBIT D

UTAH GROUNDWATER DISCHARGE PERMIT APPLICATION FOR RED LEAF RESOURCES, INC. SOUTHWEST #1 PROJECT

December 20 2011

60837.0001

Prepared by:
JBR Environmental Consultants, Inc.

EXHIBIT E

EXECUTIVE SUMMARY

Date Summary Prepared: October 5, 2011

Mine Name: Southwest #1	**I.D. Number:** M/047/0103
Operator: Red Leaf Resources, Inc.	**Date Original Notice Received:** April 28, 2011
Address: 200 West Civic Center Drive, Suite 190 Sandy, Utah 84070	**County:** Uintah
	New/Existing: New large mine on the site of existing exploration and small mine projects
	Mineral Ownership: SITLA
Telephone: (801) 878-8100	**Surface Ownership:** SITLA and Fee
Contact Person: Dr. James Patten	**Lease No.(s):** SITLA Leases ML-50150 and 43374
Telephone: (801) 878-8100	**Permit Term:** Life of Mine

Life of Mine: Phase approached for 21 years until 2033. Future Mining Phases may extend the life of mine 10 years or more.

Legal Description: Sections 19 and 29, 30 Township 13 South, Range 23 East, SLBM; Sections 25 and 36, Township 13 South, Range 22 East, SLBM.

Mineral(s) to be Mined: Oil Shale

Acres to be Disturbed: 779

Present Land Use: Grazing and Wildlife Habitat

Postmining Land Use: Grazing and Wildlife Habitat

Variances from Reclamation Standards (Rule R647) Granted: None

SOILS AND GEOLOGY

Soil Description: Soil samples identified by USDA, NRCS indicate four soil types as Gompers 4-25% slope, Gompers 25-50% slope, Walknolls-Mikim, and Whitsage-Cedarknoll complex. Soil pH ranges from about 7.9 to 9.0, so most soils are alkaline. Soils are mostly derived from the local stratigraphy. The depths of the soils vary. After initial development, the phased approach to mining will allow direct haul of salvaged soil. Soils are mostly derived from the local stratigraphy. All available suitable surface soils for revegetation will be removed from undisturbed areas within the permit boundary.

Special Handling Problems: Depth of soil is variable from hilltops to sideslopes, and some soils will not be salvaged because of adverse chemical or physical characteristics.

Geology Description: The mine is in the Uinta Basin Section of the Colorado Plateau Geologic Province. The geomorphology of the site consists of rolling terrain dissected with intermittent stream channels. Intermittent stream channel Indian Ridge Canyon is south of the permit and drains to the

northeast to intermittent stream channel Sweetwater Canyon and then into intermittent stream channel Bitter Creek all northeast of the permit area. Intermittent stream channel Reservoir Canyon dissects Section 19 of the permit and then drains into Indian Canyon. The permit areas for the Southwest #1 small mine and exploration projects are in the Parachute Creek Member of the Eocene Green River formation. In the mine area, the beds strike west-northwest and dip 12 to 13 degrees to the north-northeast. The Green River formation consists of lenticular beds of lacustrine shales, calcareous marlstone, sandstone/mudstone, with a marker bed of volcanic tuff.

HYDROLOGY

Ground Water Description: Regional groundwater movement from the area is towards the north part of the Uintah basin. A water well was drilled by the operator at the site to a depth of 900 feet and operates at 15 gpm. Records of nearby water wells with the Utah Division of Water Rights indicate two deep isolated perched aquifers at a) in a 1312-foot-deep well feet at 9 gpm at 475 feet, and b) in a 1360-deep-well 17 gpm was produced. No static water level information was available. The ground water is not susceptible to the mining operation because it is isolated by several hundred of feet of low permeability marlstone.

Surface Water Description: The mine site and the immediate surrounding area are characterized by ephemeral stream channels, flowing only in response to snow melt and major rainfall events. Intermittent stream channel Indian Ridge Canyon is south of the permit area and drains to the northeast to intermittent stream channel Sweetwater Canyon and then into intermittent stream channel Bitter Creek all northeast of the permit area. Clean water diversions and sumps will be built to manage surface water runoff at the site during mining and prior to any construction activities. All diversions and ponds were appropriately sized to handle the contributing watersheds and storm events. The project is constructed below grade, keeping all disturbed area drainage from leaving the site. Best management practices and concurrent reclamation activities will be implemented during the life of the mine operations to ensure protection of surface water resources.

Water Monitoring Plan: An analytical water monitoring program is not required, but a visual monitoring program will be implemented.

ECOLOGY

Vegetation Type(s); Dominant Species: The study area consists of four plant communities: sagebrush-grass, Colorado Plateau pinyon-juniper woodland, barren outcrop, and greasewood-sagebrush. Vegetation cover over the entire area averages 43 percent.

The area contains habitat for Graham's penstemon, a species proposed for listing as threatened. The plan contains measures to be used to survey for this species in advance of operations, avoiding populations where possible, and applying reasonable mitigation measures identified by participants in a conservation agreement that has been signed for this species. Details of mitigation measures, if needed, have not yet been decided but will be determined by the Division and the operator in consultation with the Fish and Wildlife Service and other authorities.

Wildlife Concerns: No threatened or endangered species were identified on the property, but the greater sage grouse (species of concern and sensitive) is likely to occur in the area. No known leks exist

within the lease area, but the sage grouse brood rearing habitat covers the southern third of Uintah County of which the mine is a small part. The operator will mitigate the brood rearing habitat loss by using sagebrush in the reclamation seed mix, regrading to an undulating topography and leaving ponds after reclamation.

MINING AND RECLAMATION PLAN SUMMARY:

Surface Facilities: Surface facilities will include water retention ponds and administration, maintenance and warehouse facilities. The process facilities will include capsule processing equipment, a tank farm, and associated pipelines and power lines. The mining areas include soil stockpiles, temporary overburden/interburden stockpiles, capsules, access roads, and various runoff control facilities.

During Operations: Red Leaf Resources intends to expand the existing Southwest #1 mine from a small mine to a large mining operation. Soil stockpiles will be stockpiled on site, most to be directly hauled and placed on reclaimed ground. Ore and waste will be excavated, ore will be selectively placed into a bentonite amended soil (BAS)-lined capsule, and then overburden will be placed on top of the capsule. The capsule will be heated and the kerogen extracted. A second tier of capsules will constructed after the first tier has cooled. After the second tier of capsules has cooled, the surface and sides of the capsules will be regarded, soil placed and revegetated. Reclamation will be completed in phases and not left until the end of mining. Kerogen products are to be stored on site in a lined tank farm until the product is transported off site.

There will be no discharge from the water retention pond. Sediment controls will be used in remote areas. Air quality will be protected in accordance with conditions set forth by EPA. Fugitive dust will be controlled through best management practices to include speed control and treatment of roads with water.

After Operations: All processing facilities will be removed following mining. Facilities will be demolished and, as appropriate, recycled or hauled to a disposal facility. Concrete foundations left at the site will be fractured and covered with an adequate amount of suitable cover so the area can be revegetated. If requested by the property owner, SITLA, the water well(s) may be left at the site. Small roads will be left to access the site, but all other mining roads will be reclaimed. All highwalls and endwalls will be regraded to be less steep than 45 degrees. There will be no mine dumps, as all material is utilized in the capsules. The capsules sideslopes will be regraded to a 1.5H:1V slope. Five reclamation ponds will remain in a stable configuration, to benefit stock and wildlife for the post mining land use. Following regrading, disturbed areas will be covered with an average of twelve inches of soil and seeded with a mix that includes both native and introduced species adapted to the area.

SURETY:

Amount: $3,776,000.

Form: Anticipated to be cash

EXHIBIT F

Table 1 Selected Oil and Gas Well Logs Near the Project Area

Well ID & Location	Formations	Unit Symbol	Top (feet bgs)	Thickness (feet)
Texaco Seep Ridge Unit #2				
SE1/4NE1/4 Sec 3, T14S, R22E API: 4304730135 Surface: 6834' AMSL	Parachute Creek Member, Green River Formation	Tgp	0	780
	Mahogany oil-shale zone, Green River Formation		731	
	Douglas Cr Member, Green River Form.	Tgd	780	691
	Green River-Wasatch transition zone	Tg-Tw	1471	451
	Wasatch Formation	Tw	1922	1511
	Upper Mesaverde Group	Kmv	3433	1487
	Sego Sandstone of Mesaverde Group	Kmv	4920	566
	Buck Tongue of Mancos Shale	Kmv	5486	54
	Castlegate Sandstone of Mesaverde Group	Kmv	5540	280
	Mancos Shale	Kms	5820	3400
	Frontier Formation	Kfd	9220	320
	Mowry Shale	Kfd	9540	30
	Dakota Sandstone	Kfd	9570	31
Hot Rod Oil Government Chorney B-NCT-1				
SE1/4SW1/4 Sec23, T13S, R22E API: 4304730115 Surface: 6624' AMSL	Parachute Creek Member, Green River Formation	Tgp	0	1120
	Mahogany oil-shale zone, Green River Formation		415	
	Douglas Cr Member, Green River Form.	Tgd	1120	995
	Green River-Wasatch Formations transition zone	Tg-Tw	2115	185
	Wasatch Formation	Tw	2300	1765
	Upper Mesaverde Group	Kmv	4065	1390
	Sego Sandstone of Mesaverde Group	Kmv	5455	515
	Buck Tongue of Mancos Shale	Kmv	5970	100
	Castlegate Sandstone of Mesaverde Group	Kmv	6070	280
	Mancos Shale	Kms	6350	3505

Well ID & Location	Formations	Unit Symbol	Top (feet bgs)	Thickness (feet)
	Frontier Formation	Kfd	9855	335
	Mowry Shale	Kfd	10190	30
	Dakota Sandstone	Kfd	10220	40

Source: Sprinkel 2009

10.3. Area Surface Water

Nearly all of the Project Area drains to Sweetwater Canyon Creek via Indian Ridge Canyon and its tributaries. A small portion at the north end of the Project Area drains to Klondike Canyon, which is another tributary of Sweetwater Canyon. Sweetwater Canyon Creek is tributary to Bitter Creek, which is a tributary of the White River. The confluence of Sweetwater Canyon Creek and Bitter Creek is approximately 3.3 miles northeast of the northeast corner of the RLR site. The confluence of Bitter Creek and the White River is approximately 20 miles north of the RLR site.

Annual rainfall is generally low for this region averaging 10 inches per year. The 10-year 24-hour storm event for the Project Area is 1.68 inches. (WRCC 2010)

The USGS briefly maintained a gaging station on Sweetwater Canyon Creek approximately 2 miles east of the Red Leaf site and upstream of Indian Ridge Canyon in T13S, R23E, Section 27 (Sweetwater Canyon Creek near Mouth near Watson, Utah) (Figure 3, Project Area). Drainage area for the station was 124 square miles. The gaging station was operated for four years between October 1974 and October 1978. During that period the average daily discharge was 0.089 cubic feet per second (cfs). It had zero average daily discharge for 82 percent of the period of record. Discharge periods were during spring runoff and following summer/fall storm events. The maximum discharge during these four years was 59 cfs on July 25, 1976; the average discharge for that day was 9.4 cfs, demonstrating the "flashy" nature of the stream. (USGS 2011)

The USGS maintained a gaging station on Bitter Creek approximately eight miles downstream of the Red Leaf site (Bitter Creek near Bonanza, Utah) for water years 1971 through 1989. During that period the annual average discharge ranged from 0.28 cfs in 1972 to 18.5 cfs in 1987, with the overall annual average for the period being 6.06 cfs. The maximum daily average recorded for the period was 150 cfs on September 5, 1982. Periods of no flow were common, and followed the same general hydrograph as Sweetwater Canyon Creek. (USGS 2011)

The Project Area slopes down to the east and Indian Ridge Canyon. It is dissected by numerous ephemeral drainages, and does not contain any perennial surface water sources. The USGS National Hydrography Dataset shows no springs in or near the Project Area (USGS 2010, JBR 2011). The ephemeral drainages that cross the area are typical of those found in this high-desert environment. Channels are incised in some reaches and essentially undefined in others, riparian vegetation is lacking,

and bed/bank sediment movement is evident. The runoff regime of these channels is controlled primarily by local summer thunderstorms that generate infrequent and short-lived, but often intense, flash floods.

10.4. Groundwater

10.4.1. Southern Uinta Basin Ground Water Setting

The State of Utah defines an aquifer as "a geologic formation, group of geologic formations or part of a geologic formation that contains sufficiently saturated permeable material to yield usable quantities of water to wells and springs" (UAC R317-6-1). The Utah State Water Plan (UDWR 1999) refers to the Mesa Verde Formation as the regional aquifer closest to the surface in the Project Area. However, BLM (2008) refers to the Parachute Creek and Douglas Creek members of the Green River Formation as potential aquifers locally within the Uinta Basin.

Groundwater underlies the lease area at depth (Freethy and Cordy 1991). Mesozoic-age rock underlies much of the upper Colorado River basin, including the Uinta Basin. Several aquifers of regional extent are found within these rocks (Freethey and Cordy 1991). Groundwater associated with the Mesa Verde Group is the uppermost of these larger aquifers. Within the Uinta Basin, the saturated thickness associated with this aquifer often well exceeds 2,000 feet, but is buried quite deep (Freethey and Cordy 1991). Based on Utah Division of Oil, Gas and Mining (DOGM) records of oil and gas wells near the Red Leaf project site, the top of the Mesa Verde Formation is between 3,000 and 4,000 feet below ground surface (as indicated for APIs 43-047-37336, 43-047-37283, 43-047-33488, 43-047-37523, 43-047-37522 and others (DOGM 2011). See Table 1, Selected Oil and Gas Well Logs Near the Project Area and Figure 4, Geologic Map.

Regionally, the direction of groundwater movement in this part of the Uinta Basin is toward the north and the White River. Water quality in the Mesa Verde and other regional aquifers ranges from relatively good to briny, with a range between 1,000 mg/L and 3,000 mg/L total dissolved solids expected in the aquifer underlying the Red Leaf project (Price and Miller 1975).

State and federal publications (Price and Miller 1975; Sprinkel 2009) describe the Green River, Wasatch, and Mesa Verde formations as intermixed strata of sandstone, shale, siltstone, and mudstone, with permeabilities ranging from very low to high. While the Green River Formation is generally considered an aquiclude in the southern part of the Basin, with low spring and well yields (Price and Miller 1975), the BLM (2008) considers both the Parachute Creek and Douglas Creek members as key aquifers locally in the Uinta Basin area.

10.5. Project Area Hydrogeology

The Green River and Wasatch Formations overlie the Mesa Verde Group in the project area (see Table 1), with the Parachute Creek Member of the Green River Formation being the surface bedrock formation found throughout the majority of the Red Leaf parcels (Figure 4). The Parachute Creek Member contains the Mahogany Oil Shale zone, from which RLR would extract its ore. The Douglas Creek Member underlies the Parachute Creek Member and is not exposed on the leases. Ground water from

EXHIBIT G

water will be collected for beneficial use and discharges will only occur during excessive storm events as allowed under the Nationwide NPDES Storm Water Discharge Permit.

9.6. Discharge Effluent Characteristics

This mine operation is designed to be a no-discharge operation. There is no planned discharge water or other liquid from the operation.

10. Hydrogeology Report

10.1. Regional Geology and Landform

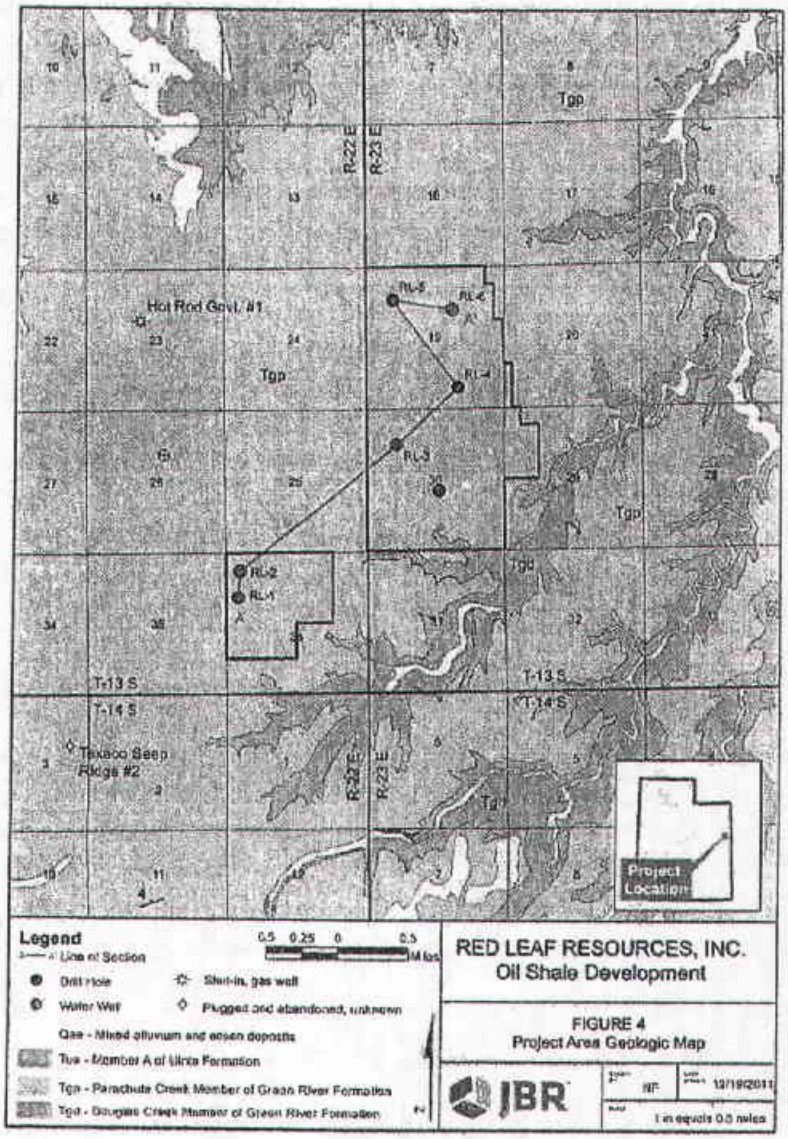
The RLR Project Area is located in the Uinta Basin section of the Colorado Plateau physiographic province (Stokes 1986). This physiographic province is also known as the Colorado Plateaus Level III Ecoregion (Woods et al 2001).

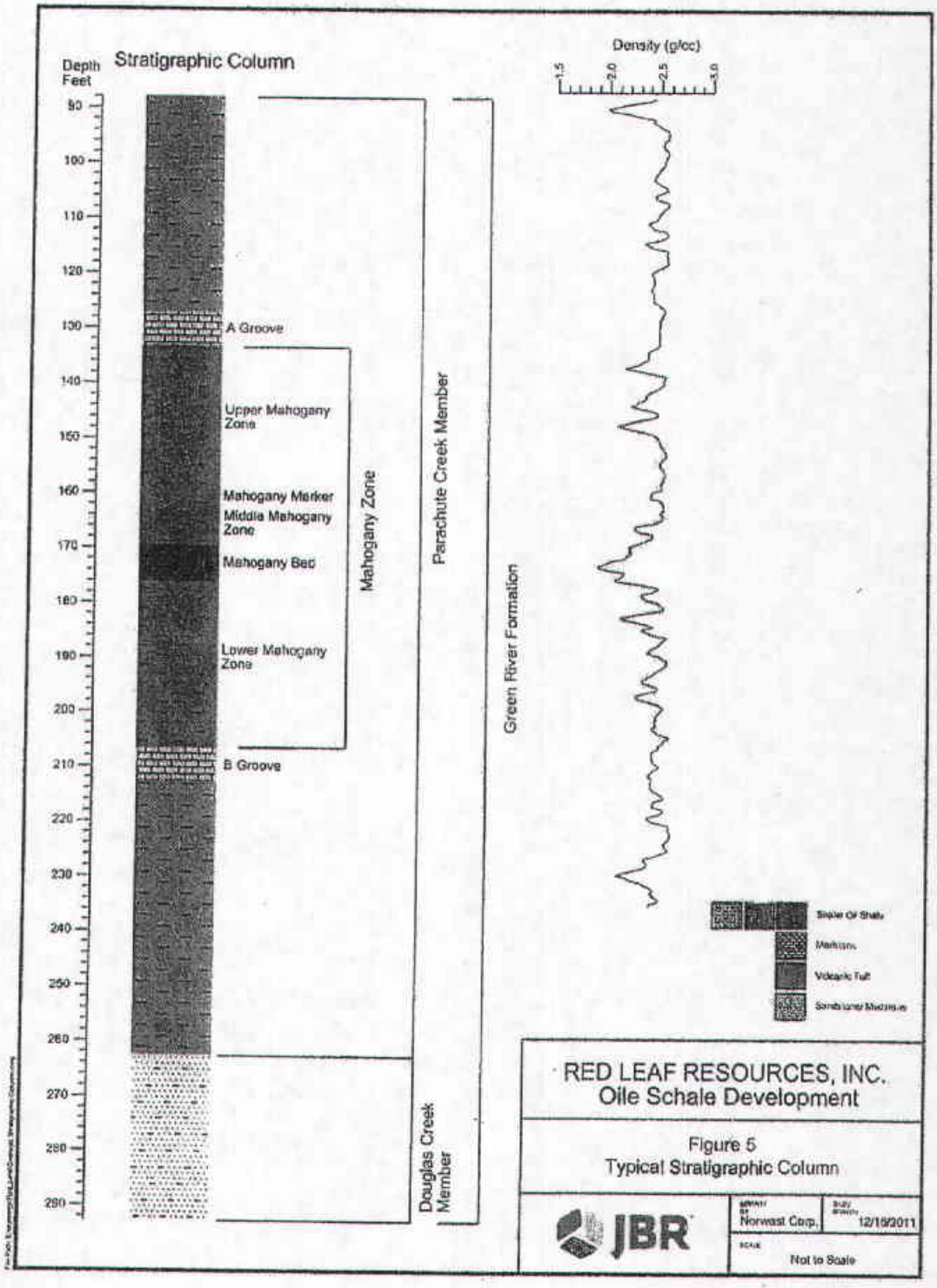
The Uinta Basin is a structural depression. The Project Area is located in the southern part of the basin and is underlain by northwesterly dipping Tertiary strata. The region is characterized by a dissected plateau with strong relief (Stokes 1986). Approximate elevation in the Project Area ranges from 6,200 feet in the northwest corner of Section 19, T13S, R23E to 6,600 feet in the southwest corner of Section 36, T13S, R22E.

10.2. Project Area and Local Geology

Bedrock at the RLR project area is the Tertiary, oil shale-bearing Parachute Creek Member of the Green River Formation. Figure 4 is a geologic map of the project area and vicinity. The Parachute Creek Member consists mainly of oil shale, which is a marlstone that contains a solid hydrocarbon material known as kerogen. The oil shale interbeds with minor amounts of siltstone, sandstone and altered volcanic tuff beds. The Mahogany Oil Shale Zone within the Parachute Creek Member will be the oil shale source for the proposed operation. Depth to the top of the Mahogany Marker, which identifies the top of the kerogen-rich Mahogany Zone, is between the surface and 160 feet below ground surface (bgs) in the Project Area. Six core holes were drilled on the property for RLR by Norwest in 2010. The holes were cored in their entirety and ranged in depth from 140 to 240 feet, depending on overburden thickness. Figure 5 is a typical stratigraphic column for the section penetrated by the 6 core holes at Red Leaf and prepared by Norwest.

The typical stratigraphic column depicts rock types encountered and the locations of key stratigraphic zones or markers in the oil shale horizon including the Mahogany Marker, the Mahogany Bed, a stratigraphic interval located above the Mahogany Marker known as the A Groove; and another interval beneath the ore zone, which is called the B Groove. These two horizons get their names from their appearance in outcrop where, unlike the cliff-forming Mahogany zone, they are slope formers.


R-22 E
R-23 E
T-13 S
T-14 S
Hot Rod Govt. #1
Texaco Seep Ridge #2
RL-1
RL-2
RL-3
RL-4
RL-5
Tgp
Tgd
Project Location
Legend
Line of Section
Drill Hole
Water Well
Shut-in, gas well
Plugged and abandoned, unknown
Qae - Mixed alluvium and eolian deposits
Tua - Member A of Uinta Formation
Tgp - Parachute Creek Member of Green River Formation
Tgd - Douglas Creek Member of Green River Formation
0.5 0.25 0 0.5 Miles
RED LEAF RESOURCES, INC.
Oil Shale Development
FIGURE 4
Project Area Geologic Map
JBR
12/19/2011
1 in equals 0.5 miles


Depth Feet
Stratigraphic Column
Density (g/cc)
1.5
2.0
2.5
3.0
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
A Groove
Upper Mahogany Zone
Mahogany Marker
Middle Mahogany Zone
Mahogany Bed
Lower Mahogany Zone
B Groove
Mahogany Zone
Parachute Creek Member
Green River Formation
Douglas Creek Member
Shale Oil Shale
Marlstone
Volcanic Tuff
Sandstone/Mudstone
RED LEAF RESOURCES, INC.
Oil Schale Development
Figure 5
Typical Stratigraphic Column
JBR
Norwest Corp.
12/15/2011
Not to Scale

The B-Groove is easily identified in outcrop; however, its appearance in the subsurface is difficult to distinguish visibly. As a result, it is typically identified in the subsurface by geophysical logs or fisher assay data (Cashion, 1992).

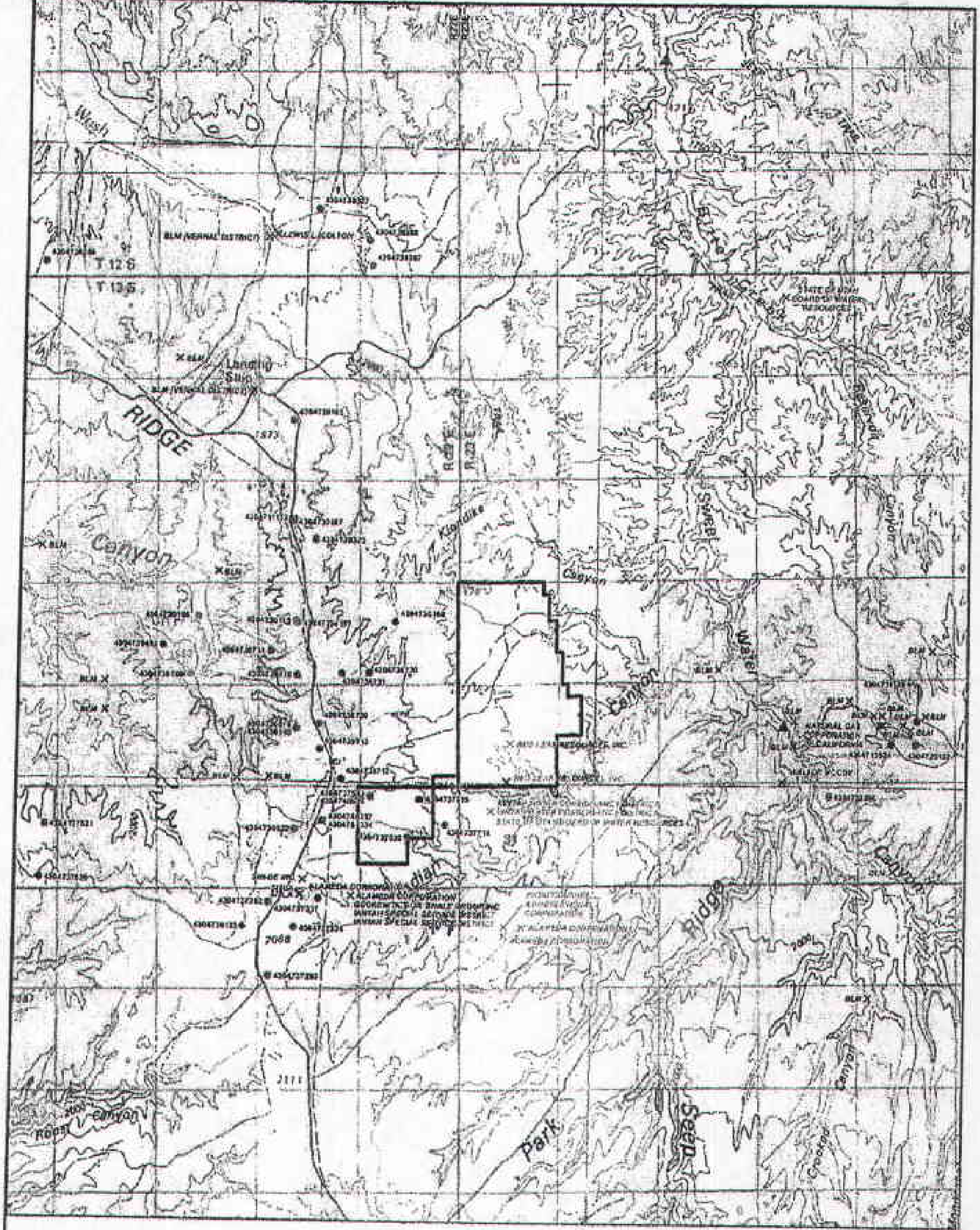
Bulk density logs were run for each of the 6 core holes. Figure 6 is a cross section generally oriented north south that extends through 5 of the 6 core holes. Drill hole locations are shown on the Geologic Map (Figure 4). Each hole on the cross section is represented by a neutron density log showing the "picks" for the stratigraphic markers and beds as well as the ore zone to be mined. These markers and beds are correlated on the cross section. The datum for the cross section is mean sea level. The cross section shows the northward dip of the beds. The rock types present in all of holes are consistent and the dominant rock type is oil shale, as Figure 5 shows. The other rock types are mudstones which occur in the A-Groove and B-Groove horizons and elsewhere, thin silicified tuff horizons, most notably the Mahogany Marker, and a sandstone layer that is present beneath the zone to be mined.

The sandstone is cemented by calcium carbonate and is not porous. Water was encountered during drilling in one hole, RL-1, which is the southern-most hole drilled (Figure 6). Hole RL-1 was drilled at the head of a small draw and the water was encountered in fractures near the top of the hole. No water was encountered at depth in RL-1 or in any of the other holes. It should be noted that core holes are drilled with water as a circulation medium. Small quantities of water might not be observed; however, any significant water-bearing horizon would be recognized by an increase in circulation rate (return of water to the surface).

Regional ground water conditions and their relationship to the Southwest #1 project area are discussed further below.

Table 1, below, shows summaries from the logs of oil and gas wells nearest to the Project Area that were used by Sprinkel (2009) to develop the "Interim Geologic Map of the Seep Ridge 30'x60' Quadrangle." Only the upper portions of the logs, from the surface through the regional Mesa Verde aquifer to the Dakota Sandstone, are shown. They place the Douglas Creek Member of the Green River Formation 780 to 1100 feet bgs and show the relative location of the Mahogany Zone within the Green River Formation. The Douglas Creek Member potentially contains the upper most aquifer in the Green River Formation in the eastern Uinta Basin.

EXHIBIT H



Legend

Lease Boundary

▲ USFS Gaging Station

× Water Right Point of Diversion (Owner)

● Oil / Gas Well (API #)

Land Ownership

Federal

State

Private

5,000 0 5,000 Feet

RED LEAF RESOURCES, INC.
Southwest #1 Project

FIGURE 3
PROJECT AREA

JBR | CP | 05/20/2011 | 1:60,000

8.6. Well Logs

Wells in the area are owned by the Bureau of Land Management (BLM), one private owner, and Red Leaf Resources. The RLR water is permitted for industrial use, the other water is designated for wildlife or stock use. Well logs and area hydrogeology are discussed in the hydrogeology report, below.

9. General Discharge Identification

9.1. Discharge Point Identification

This mine operation is designed to be a zero-discharge operation. There are no point discharges from the operation. The facility is conservatively designed. Containment of all product liquids and gases is insured through secondary containment of all tanks and clay seals 3-feet thick surrounding each ore processing capsule.

9.2. Planned Discharges

This mine operation is designed to be a no-discharge operation. There is no planned discharge water or other liquid for the operation. Storm water will not contact waste materials and will be managed on site for use as part of the project's water supply. Any storm water discharges will be in compliance with the facility's Nationwide NPDES Storm Water Discharge Permit for storm water management.

9.3. Potential Discharges

This mine operation is designed to be a no-discharge operation. There is no potential for discharge of non-storm-water-induced water or other liquids from the operations.

9.4. Means of Discharge

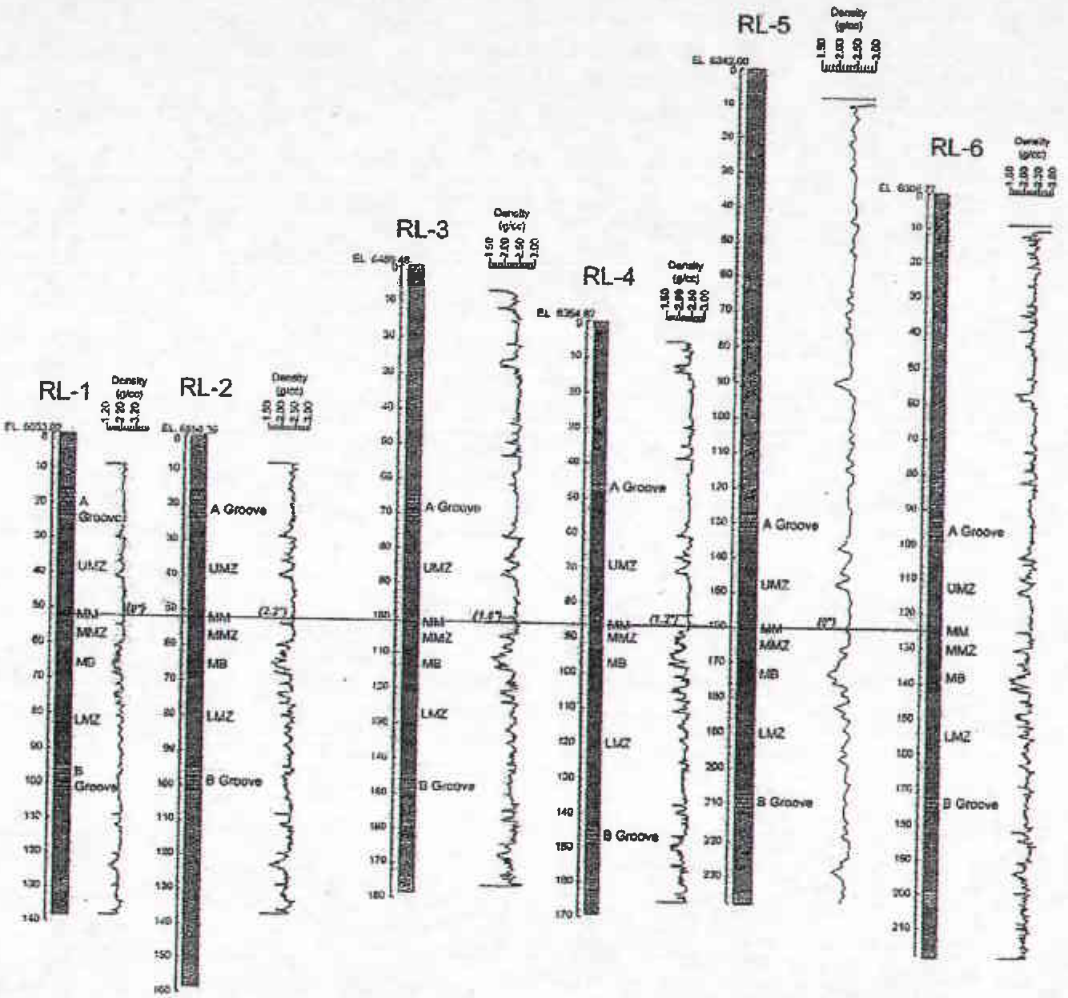
The process capsules are designed to prevent both infiltration of precipitation-derived water into them and discharge of fluids from them. The capsules are conservatively designed as discussed further below in this document. The cover material is engineered as an impermeable cap that will be graded and revegitated negating the necessity of post closure care after revegetative cover has been established.

Stockpiles of mined ore are not potential sources of contamination due to contact with precipitation and subsequent discharge. Following the commencement of capsule construction, ore will be mined and placed in open capsules, all of which will be contained in the open pit, thereby preventing discharge of any contact water.

9.5. Flows, Sources of Pollution, and Treatment Technology

All process flows will be contained in both primary and secondary containment. There are no process discharges from the facility. No treatment of waste water or waste solid is required as there are no process-associated waste streams. Solid wastes are fully encapsulated in the process capsules. Storm

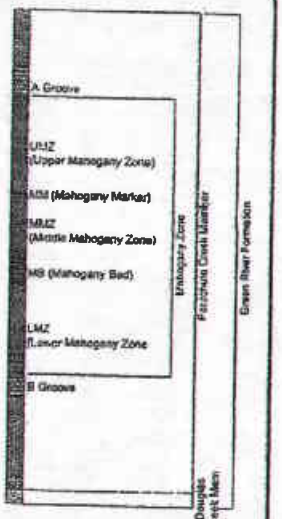
EXHIBIT I



Legend

Shale/ Oil Shale
Mudstone
Volcanic Tuff
Sandstone/ Marlstone

(2.2°) Apparent dip of Mahogany Marker between drill hole



Cross Section developed by Norwest Corp

RED LEAF RESOURCES, INC.
Oil Schale Development

Figure 6
Geologic Cross Section
(Datum is Mahogany Marker)

JBR

Drawn by	Date
CF	12/01/2011
Scale	Horizontal - NTS Vertical - as shown

EXHIBIT J

much of the project's extraction and reclamation activities are conducted below grade and any potential run-on will be redirected into diversions and storage ponds. It is anticipated that downstream drainages will not be impacted by mining activities. A detailed Drainage Control Plan that describes the design of all measures is provided as **APPENDIX E** of this application.

Groundwater is not susceptible to any impacts from the mining and retorting operations because it is isolated from those operations by several hundred feet of low permeability marlstones. While the B-groove can be a water-bearing interval in other areas such as the Piceance Basin in Colorado, the B-groove in the Uinta Basin at the bottom of the Mahogany Zone is unsaturated in this area. The first potential porous unit occurs approximately 50-100' below the Mahogany zone, which are sandstone making the top of the Douglas Creek Member of the Green River Formation, described by Holmes and Kimball. Vertical permeability through the Green River Formation is restricted to jointing, which is limited even in outcrop, and infrequent below the mantle of weathering. Classic dikes in the oil shale section described by Donnell in the east margin of the basin have not been observed in the Kimball Creek area.

Water Resources

Surface Water Quality

There are no perennial water sources within the project area, so there is no information on surface water quality.

Groundwater Quality

Based on pre design conference review, Red Leaf interprets that the Division of Water Quality (DWQ) is satisfied that the project does not impact water. A formal statement from DWQ is pending. The formal letter submitted to DWQ by JBR Environmental Consultants on behalf of Red Leaf Resources is provided as **APPENDIX N.**

EXHIBIT K

the Douglas Creek aquifer discharges to stream channels in the southern Uinta Basin and to wells in the northern part of the Basin.

According to records on file with the Utah Division of Water Rights (2011), groundwater in the vicinity of the Red Leaf project has been encountered at depths shallower than those reported by Price and Miller (1975) or Freethey and Cordy (1991) for the Mesa Verde. Records of nearby water wells on file with the Utah DWR (2011) show the following:

1. A 455-foot well in T14S, R23E, NEX Section 6 was drilled and abandoned during year 2004 due to a lack of water;
2. A 1,312-foot-deep well drilled in 1978 had a static water level of 475 feet and produced at a rate of 9 gallons per minute (GPM) during a pump test; this well is in T14S, R22E, Section 2 (southwest of the Red Leaf parcels) and first encountered water at 890 feet;
3. A 900-foot well drilled in T13S, R23E, SEX Section 30 in 2010 (by RLR), hit water at 603 feet with a production rate of 1 GPM. A second formation at 830 feet yielded 15 GPM.

These ground water occurrences likely reflect localized, perched aquifers associated with lenses of permeable bedrock in the Douglas Creek Member of the Green River Formation. Alluvial deposits are minimal in the RLR parcels and are insufficient to meet the state definition of an aquifer. The Douglas Creek Member of the Green River Formation crops out in some of the deeper canyons in and near the Project Area (Sprinkel 2009).

The oil shale-rich-Parachute Creek Member behaves as an aquiclude inhibiting recharge of underlying horizons by infiltrating precipitation on the Red Leaf leases. Recharge to the underlying Douglas Creek Member from the surface on the leases themselves is therefore de minimus.. The recharge area for the Douglas Creek Member is the expansive outcrop area in the southern-most part of the Uinta Basin. From the recharge area, ground water flows to the north where it recharges the aquifer in the central part of the basin and discharges in the many stream channels that dissect the entire area (Holmes and Kimball, 1987). As the geologic map on Figure 4 shows, the Douglas Creek Member crops out in Indian Ridge Canyon immediately to the south of the Red Leaf lease blocks. The extensive area of outcropping Douglas Creek Member is located south of the Red Leaf leases (Sprinkel, 2009). However, the upper strata of the Douglas Creek Member in both Indian Ridge Canyon and the canyon to its south have been exposed on the canyon walls by erosion. As a result, any ground water moving to the north through the upper Douglas Creek would be intercepted by these canyons, preventing ground water flow from reaching the upper Douglas Creek Member beneath the Red Leaf leases. Any ground water flowing through the upper part of the Douglas Creek member would discharge at the outcrops on the south walls of these canyons. Holmes and Kimball (1987) reported no springs on the south canyon walls.

The B-Groove horizon is known to be a water-bearing horizon in the Piceance Creek Basin in northwestern Colorado where its lithology is comprised of sandstone, siltstone, some marlstone and lean oil shale (BLM, 2006). These lithologies along with fracturing result in sufficient transmissivity to enable the B Groove to behave as an aquifer, at least locally in the Piceance Creek Basin. At the White River mine in eastern Uintah County, the B-Groove is not mentioned as an aquifer in the Environmental Assessment (EA) performed for by the BLM for the Oil Shale Exploration Company's Research

Development and Design (RD&D) lease (BLM Environmental Assessment UT-080-06-280-EA). Presumably the dewatering activity necessary for reopening the mine would impact recharge to a B Groove aquifer and the impact would have been analyzed in the EA. It is reasonable to presume that the B Groove is not an aquifer at the White River Mine.

In contrast to the B Groove lithology in the Piceance Basin, the B-Groove horizon at the Red Leaf project area is described consistently in all 6 drill holes as being comprised of mudstone, brown- or blue-gray in color, lean (oil shale-poor), and weakly to strongly laminated. Only occasional short, vertical, closed fractures are noted in the core logs. A laminated mudstone would have no primary porosity or permeability and would tend not to preferentially develop secondary permeability through fracturing, as the rare occurrences of closed fractures indicates.

Maximum depth of the mine floor would not exceed 250 feet bgs, and the depth from the surface to the shallowest occurrence of ground water known is 600 at the Red Leaf water well; therefore the thickness of intervening Parachute Creek and Douglas Creek strata beneath the bottom of the open pit feet and the shallowest known ground water occurrence is no less than approximately 350 feet.

The oil and gas well logs used by Sprinkel (2009) that are nearest to the RLR site are shown in Table 1 from the surface through the regional Mesa Verde aquifer and the Dakota sandstone. They are consistent with the three water wells described above in placing the Douglas Creek Member of the Green River Formation 780 to 1100 feet bgs.

10.6. Surface and Ground Water Quality

Table 2 shows selected water quality data from the USGS Sweetwater Canyon Creek gaging station during its four years of record, and Table 3 shows selected water quality data from the USGS Bitter Creek gaging station during its 18 years of record. They show dissolved solids concentrations increasing in the downstream direction.

Table 2 Selected Water Quality Data for the USGS Sweetwater Canyon Creek near Mouth near Watson, Utah Gaging Station, Water Years 1974-1977.

Parameter	# of Samples	Average	Minimum	Maximum
pH (SU)	9	8.2	8.0	8.5
Total Dissolved Solids (mg/L)	11	1,930	1,350	2,200
Total Dissolved Solids (tons/day)	8	2.7	0.52	10.6
Suspended Sediment (mg/L)	11	3,784	202	8,660

EXHIBIT L

REDleaf
RESOURCES, INC.

November 28, 2011

Via Hand Delivery and Electronic Mail (danadean@utah.gov)

Ms. Dana Dean, P.E.
Associate Director Mining
Division of Oil Gas and Mining
1594 West North Temple
Suite 1210
PO Box 145801
Salt Lake, City, Utah 84114-5001

Re: Comments of Red Leaf Resources, Application for Large Mining Operations, M/47/0103

Dear Ms. Dean,

Red Leaf Resources, Inc. ("**RLR**") submits this letter in support of the Large Mining Application for the Southwest #1 Facility ("**NOI**") as conditionally approved on October 20, 2011by the Utah Division of Oil Gas and Mining ("**DOGM**" or "**Division**").

RLR understands, per the DOGM letter granting conditional approval of the NOI, that NOI approval is conditioned on either the receipt of a letter from the Utah Division of Water Quality ("**DWQ**") stating that RLR does not need a groundwater discharge permit *or* DWQ's issuance of the appropriate permits. Subsequent to submitting its NOI application, RLR met with DWQ to determine the need for a groundwater discharge permit. The Southwest #1 facility is designed as a zero-discharge operation. Therefore, as stated in the NOI application, RLR did not expect that a groundwater permit would be required. However, by letter dated October 6, 2011, DWQ requested RLR to apply for a groundwater discharge permit for the Southwest #1 facility. RLR is now preparing applications for both groundwater discharge and construction permits for submission to DWQ in early December, 2011. These permit applications should not be taken as a change to RLR's expectation of zero discharge to groundwater resources in the area. If the groundwater permit requires discharge limitations, RLR will so advise DOGM.

Further, RLR notes that DWQ's requirement for a permit does not indicate that the State disagrees with RLR's projection that the facility will be zero-discharge with respect to groundwater resources. DWQ routinely requires permitting of other mining operations (such as heap-leach pads) that are designed and operated without discharges. The EcoShale™ In-Capsule process renders improbable the discharge of pollutants into groundwater. The purpose of the groundwater permit is to assure that RLR's proposed operation and containment measures function as designed.

In its comments dated November 18, 2011, Western Resource Advocates ("**WRA**") alleges that Norwest has questioned the structural integrity of the EcoShale™ In-Capsule design. RLR believes that WRA's comment refers to the last bullet on page 6 of Norwest's Geotechnical Analysis

200 W. Civic Center Drive, Suite 190 | Sandy, UT 84070 | Office 801.878.8100 | Fax 801.878.8101 | www.redleafinc.com

dated April 21, 2011, included as Attachment I to the NOI. The Norwest Analysis focused specifically on the stability of backing walls of the capsules. To provide context to the Norwest statement, the cited language was only one of six recommendations to strengthen the design of the capsules. Norwest recommended that the effects of retorting on the backing wall and BAS be evaluated thoroughly as capsule design continued. RLR considered Norwest's recommendations in the current design set forth in the NOI. As part of the design process, the RLR team has been very diligent and deliberate in investigating all issues of capsule integrity and potential impacts to every element of the capsule design. The findings of these investigations were integrated in the final design of the capsule as submitted to DOGM in RLR's NOI, dated September 1, 2011. This NOI addresses the issues raised in the Norwest Analysis dated April 21, 2011—4 months prior to RLR's final NOI. Additionally, the major elements of capsule design are addressed in the application to be filed with DWQ and will be further assured by RLR's proposed monitoring plan. RLR will advise DOGM should DWQ require additional monitoring of structural integrity beyond that discussed in the NOI as a condition of the groundwater permit. Moreover, RLR will adhere to all reclamation requirements and revegetation requirements as indicated in its NOI and reclamation contract.

RLR's Quality Assurance and Control ("QA/QC") plan specifies testing procedures for design and construction of the EcoShale™ In-Capsule Process. The QA/QC Plan includes testing procedures for determining the integrity of the installed Bentonite-Amended Soil ("BAS") layer to assure construction of the capsule shell at a hydraulic conductivity of 10^{-7} cm/sec , a commitment of the NOI. As stated in its application, the BAS layer will provide a seal such that the process capsule is "impermeable" and in compliance with RLR's NOI commitments, including its operation as a minor source for air emissions. *See* NOI, Appendix F, Emissions and Minor Source Qualification Statement. Submission of a QA/QC plan is also required as part of the DWQ groundwater application process.

RLR's NOI fulfills all of the requirements of the applicable DOGM rules and regulations. No substantive issues have been raised in public comment which would require a hearing under Utah Code Ann. § 40-8-13 or R-647-4-116.4. As such, RLR urges DOGM to issue a final decision approving the NOI on the terms and conditions set forth in its approval letter dated October 20, 2011, including obtaining a groundwater discharge permit if deemed necessary by DWQ.

Sincerely,

Laura S. Nelson

Dr. Laura Nelson
VP Energy and Environmental Development

cc: Denise Dragoo, Esq.
Robert Bayer, JBR Environmental Consultants

EXHIBIT M

GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

March 9, 2012

CERTIFIED MAIL
7004-2890-0000-6087-5918

Rob Dubuc
Western Resources Advocates
150 South 600 East, Suite 2AB
Salt Lake City, UT 84102

Subject: FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER FOR THE INFORMAL CONFERENCE ON THE DIVISION'S TENTATIVE CONDITIONAL APPROVAL OF RED LEAF RESOURCES' NOI FOR THE SOUTHWEST MINE #1 M/047/0103.

Dear Mr. Dubuc;

On February 24, 2012 an Informal Conference was held at the Utah Department of Natural Resources in Salt Lake City, UT. The purpose of the hearing was to: 1) present the basis for Living Rivers' comments on the Utah Division of Oil, Gas and Mining's Tentative Approval of Red Leaf Resources Notice of Intention to Commence Large Mine Operations for the Southwest #1 Mine M/047/10103; and 2) issue a final appealable ORDER determining whether the applicant has met the relevant rules and a Final Notice of Intention should be approved. As a result of a review of all pertinent data and facts, including those presented at the Informal Conference, the attached document constitutes the FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER.

Pursuant to Utah Admin Code R647-5-106(17) within **ten (10) days** of receipt of this ORDER, you or your agent may make a written appeal to the Board of Oil, Gas and Mining. Your appeal may be filed with Julie Ann Carter, Board Secretary P.O. Box 145801 Salt Lake City, UT 84115-5801. If you have questions regarding the filing, she can be contacted at juliecarter@utah.gov or (801) 538-5277.

If you have questions or concerns please contact me at (801) 538-5334.

Sincerely,

John R. Baza
Director Division of Oil, Gas and Mining
Informal Conference Hearing Officer

1594 West North Temple, Suite 1210, PO Box 145801, Salt Lake City, UT 84114-5801
telephone (801) 538-5340 • facsimile (801) 359-3940 • TTY (801) 538-7458 • *www.ogm.utah.gov*

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

--ooOoo--

IN THE MATTER OF THE INFORMAL CONFERENCE on the TENTATIVE CONDITIONAL APPROVAL OF RED LEAF RESOURCES NOTICE OF INTENTION TO COMMENCE LARGE MINE OPERATIONS FOR THE SOUTH WEST MINE #1 M/047/0103.	:	**FINDINGS OF FACT, CONCLUSIONS LAW, AND ORDER.** **CAUSE NO. M/047/0103**

--ooOoo--

PROCEDURAL HISTORY

1. Pursuant to Utah Code Ann. § 40-8-13(6) and Utah Admin. Code R647-4-116 on October 20, 2011 the Division of Oil, Gas, and Mining ("DOGM") published notice of DOGM's Tentative Approval of Red Leaf Resources' ("Red Leaf") NOI to Commence Large Mine Operations for the Southwest #1 Mine M/047/0103 ("NOI").

2. On October 20, 2011 DOGM sent a letter to James Patten of Red Leaf notifying Red Leaf of the tentative approval and that the approval was conditioned on complying with Condition 1 stating: "**Thirty days (30)** prior to ground disturbance, please include in the plan either a groundwater discharge permit (including a permit by rule) from the Utah Division of Water Quality (DWQ), or a letter saying a permit is not required."

3. The thirty day public comment period on a tentative approval of a large mine NOI provided for under Utah Code Ann. § 40-813(6)(d)(ii) and Utah Admin. Code R657-4-116(2) and identified in the published Notice of Tentative Approval ended on November 28, 2011.

4. Pursuant to Utah Code Ann. § 40-8-13(6)(d)(i) and Utah Admin. Code R647-4-116(2) on November 18, 2011 Living Rivers' timely submitted a Protest to the Tentative Approval.

5. Living River's Protest identified four areas of concern: 1) the NOI failed to adequately account for the possible existence of susceptible groundwater resources in the area of the mine; 2) the NOI failed to account for the possible impacts to ground water in the area of the mine; 3) there is no evidence that Red Leaf intends to obtain or that DOGM intends to require a groundwater permit from the Division of Water Quality ("DWQ"), as required by DWQ regulations; and 4) the NOI fails to provide adequate information to show that the design of the EnShale (sic) capsules will be sufficient to prevent leakage of petrochemicals into the area surrounding the mine, and specifically into local perched groundwater aquifers.

6. Pursuant to Utah Code Ann. § 40-8-13(6)(d)(iii) and Utah Admin. Code R647-4-116(4), DOGM determined that Living Rivers' comments constituted "written objections of substance" and on February 9, 2012 sent notice of a Formal Adjudicative proceeding before the Division on the matter to Living Rivers and Red Leaf.

7. DOGM Director John Baza was designated Hearing Officer in the matter. Mr. Baza was represented by Emily E. Lewis of the Utah Attorney General's Office.

8. Pursuant to Utah Code Ann. § 40-8-13(6)(d)(iii) and Utah Admin. Code R647-4-116(4) a formal adjudicative hearing before the Division was commenced on February 23, 2012 at 9:15 a.m. at the Utah Department of Natural Resources building in Salt Lake City, Utah.

9. Pursuant to Utah Code Ann. § 63G-4-207 any person may file a signed, written petition to intervene in a formal proceeding. The Hearing Officer received no written petitions from anyone seeking to intervene in the formal proceeding.

10. Pursuant to Utah Code Ann. § 63G-4-202(3), deeming it prior to the issuance of a final order in the matter, in the public interest, and not unfairly prejudicial to the rights of any party, the Hearing Officer converted the formal adjudicative proceeding to an Informal Hearing.

11. The hearing was conducted informally pursuant to: Utah Code Ann. § 63G-4-203: Procedures for Informal Hearing; Utah Admin Code R647-5-106: Procedures for Informal Phase; Utah Admin. Code R647-5-107: Exhaustion of Administrative Remedies; and in the event of a conflict between Utah Code Ann. § 40-8-1 et seq, and implementing rules for Large Mine Operations at Utah Admin. Code R647, the Utah Administrative Procedures Act ruled.

12. Pursuant to Utah Code Ann. § 63G-4-203(1)(g) intervention in the Informal Hearing was prohibited.

13. Pursuant to Utah Code Ann. § 63G-4-203(1)(c) the parties were permitted to testify, present evidence, and comment on the four issues listed in Living Rivers' November 18, 2011 Protest.

14. Pursuant to Utah Code Ann. § 63G-4-103(f) the parties to the Informal Hearing were:

15. Living Rivers, represented by Rob Dubuc and Joro Walker of Western Resources Advocates. Elliot Lips of Great Basin Earth Sciences, Inc. testified on hydrology issues on behalf of Living Rivers.

16. Red Leaf Resources, represented by Denise Dragoo of Snell & Wilmer. Fran Amendola of Norwest, testified on the modeling and design of the EcoShale™ In-Capsule Technology ("Capsule") on behalf of Red Leaf. Bob Bayer, of JBR Environmental, testified on hydrology issues on behalf of Red Leaf. Laura Nelson, Vice President Energy and Environmental Development, Red Leaf Resources, provided comments on behalf of Red Leaf.

17. The Utah Division of Oil, Gas, and Mining, represented by Steven F. Alder of the Utah Attorney General's Office. Paul Baker, Environmental Manager, testified on the history of the permit on behalf of DOGM. Leslie Heppler, Mining Engineer III, testified about the mine design and ground water on behalf DOGM. Tom Munson, Hydrologist, testified on surface water on behalf of DOGM.

18. Also in attendance were: LaVonne Garrison, Assistant Director Oil and Gas, SITLA; Sonja Wallace, SITLA; Dana Dean, Assistant Director, DOGM; Earlene Russell, Administrative Assistant, DOGM; Samantha Julian, Director, Utah Office of Energy Development; John Nowoslawski, Manager Unconventional Fuels, Utah Office of Energy Development; Gibson Peters, Manager Conventional Fuels, Utah Office of Energy Development; John Weisheit, Living Rivers; and Jeff Hartley, Hartley & Associates.

FINDINGS OF FACT

Based on information provided at the Informal Hearing, testimony, and information in Division files, I make the following Findings of Fact.

19. These were the only two requirements under the Large Mining Rules at issue at the Informal Hearing were Utah Admin. Code R647-4-106.8, Depth to Ground Water, Extend of Overburden Material, and Geologic Setting, and Utah Admin. Code R647-4-109.1, Projected Impacts to Surface and Ground Water.

20. On April 28, 2011 Red Leaf Resources submitted Notice of Intention to Commence Large Mine Operations for Southwest #1, File # M/047/0103 ("NOI") to DOGM to expand its current small mine operation.

21. The Southwest Mine #1 is to be located on SITLA Mineral Leases (ML) 50150 and 43374. The acreage associated with the mine plan from ML 50150 includes Township 13 S, Range 23 East, Sections 19, 20, 29 and 30 (SLBM) comprising 1318.78 acres. The acreage associated with the mine plan from ML 43374 includes 320 acres in Township 13 South, Range 22 East, Section 36 (SLBM).

22. The NOI identified oil shale from the Mahogany Zone as the mineral to be mined and Red Leaf will use its in-situ EcoShale™ In-Capsule Technology to process the shale.

23. Page 33 of the original NOI's Narrative Statement included the statement "The Division of Water Quality (DWQ) is satisfied that Red Leaf's project does not impact water based on out pre-design conference review. A formal statement from DWQ is pending and will be provided as Appendix N to this document when available."

24. On July 20, 2011 the Paul Baker, Minerals Program Manager sent DOGM's Initial Review of the NOI to Red Leaf detailing comments Red Leaf needed to address prior to DOGM granting tentative approval of the NOI. A technical correction of this document was resent to Red Leaf on August 3, 2011.

25. In these comments DOGM requested Red Leaf make the following changes related to ground and surface water:

    1) to comply with R647-4-105.1: adjust Figure 14, Surface Water Resources Map, to add more detail on the drainages and to use different symbols for a perennial stream or river versus an intermittent stream or river, etc.;

2) to comply with R647-4-106.2: design sumps for a larger storm event;
3) to comply with R647-4-106.8: include a geology map and refer to the location in the text, label Figure 13 "Typical Stratigraphic Colum," rewrite several conflicting paragraphs based on the actual water table data provided; and
4) to comply with R647-4-109.1: make a technical correction to Figure 14, Surface Water Resources.

26. On Sept 6, 2011 Red Leaf Resources provided DOGM with responses to DOGM's comments and submitted a corrected NOI that replaced the hybrid NOI form/narrative statement application format with a NOI application in a narrative statement format.

27. On September 22, 2011 Red Leaf submitted an Application for Mine Plan Revision or Amendment seeking to replace: Figure 1, Vicinity & General Layout Map; Figure 5, Post Mine Topography; Figure 13, Typical Stratigraphic Column; Figure 17, Red Leaf Project Area Geology.

28. On September 27, 2011 DOGM accepted the Amendment and replaced the Figures in the NOI.

29. On October 6, 2011 Rob Herbert of the Utah Division of Water Quality sent a letter to Bob Bayer of JBR Environmental Consultants stating that DWQ had determined Red Leaf would need to submit a completed application for a ground water discharge for the Southwest Mine #1.

30. On October 7, 2011 Red Leaf submitted an Application for Mine Plan Revision or Amendment seeking to replace page 6, 18, 19, 27, 43, 46, 53, 54, 55, 58 (pages relating to comments made in DOGM's initial review) and to add Appendix K of the NOI. Reflecting the DWQ's request for a ground water discharge permit application, the language on page 33 of the original NOI (see finding 23), now renumbered page 42, was adjusted to reflect communications with DWQ.

31. Appendix K of NOI is titled "Executive Summary of Water Strategy for Red Leaf Resources" and describes how Red Leaf Resources will manage water resources at the mine site.

32. On October 17, 2011 DOGM accepted the Amendment and replaced the requested pages and added Appendix K to the NOI.

33. Page 37- 38 of the resubmitted NOI, entitled *106.8: Depth to Groundwater, Extent of Overburden Material and Geologic Setting*, includes a narrative description of the ground water in the area. The description identifies groundwater associated with the Mesa Verde Group as the uppermost aquifer of regional extent in the permit area. As indicated by DOGM's own oil and gas files, the top of the Mesa Verde Formation is between 3000 -4000 feet below ground surface.

34. The NOI states that surface data from Price and Miller (1975) indicated the Parachute Creek and Douglas Creek members, formations within the project area that lie above the Mesa Verde Group, are key aquifers in the area. Red Leaf's narrative addressed this information in three ways: 1) demonstrating there are no USGS mapped springs issuing from either of these members in or near the parcels; 2) exploration drilling by Red Leaf did not encounter ground water; and 3) records of nearby water wells from the Utah Division of Water Rights indicate varying low amounts of ground water present.

35. At the Informal Conference, Leslie Heppler, Division Mining Engineer III, testified how she came to the conclusion Red Leaf's NOI met the requirements of 647-4-106.8. She stated,

> "in the form of a map, a geologic map that I was able to double-check with an Open-File report that was published by UGS. The report number was 549DM. And the geologic data was correct. There was also a typical cross section that was provided for the area that referenced the overburden material. And there was a narrative in the plan that described depth to ground water per our rule." Transcript pg. 50.

36. Similarly, Tom Munson, Surface Water Hydrologist, testified that Utah Admin. Code R647-4-105.1.12, "Maps, Drawings, and Photographs – perennial streams, springs and other bodies of water . . . within 500 feet of proposed mining operations" does not include any specific methodology explaining how an operator must identify springs. Transcript at 51. Mr. Munson determined that that Red Leaf's inclusion of USGS maps of seeps and springs was an acceptable means of meeting the relevant requirements of Utah Admin. Code R647-4-106.8. *Id.*

37. Page 40-42 of the NOI, is entitled, VI. R647-4-109 Impact Statement, 109.1 Projected Impacts to Surface and Groundwater Systems. The NOI states surface waters are generally not present being ephemeral/intermittent and that rainfall is generally low.

38. Page 41 of the NOI describes how Red Leaf intends to use best management and reclamation practices to mitigate any impacts to surface water if present. These practices include, among others: installing prior to earth disturbing activities water diversions, sumps, and ponds designed to account for a 100-year 24 hour storm event and perimeter ponds and ditches for runoff control. The NOI also includes Appendix E, a Drainage Control Plan.

39. At the Informal Hearing Mr. Munson testified he felt the NOI met the requirements of R647-4-109.1 stating,

> "[Red Leaf] . . . provided a very detailed – not a general – narrative in regards to surface water designed using definitely (sic) industry standards in regards to that information and have met the requirements of that rule, from our perspective. . . . [Red Leaf also] designed a storm water plan using all appropriate . . . standard design events, and actually went above and beyond what we would have required for that design . . . which will work, I thought, very well based on my technical expertise of 29 years as a surface water hydrologist working on hundreds of mines." Transcript at 52.

40. Page 42 of the NOI states that ground water is not susceptible to any impacts from the mining and retorting operations because it is isolated from those operations by several hundred feet of low permeability marlstones.

41. Ms. Heppler testified she reviewed the NOI and concurred with the conclusion that there was no potential for groundwater impacts and R647-4-109.1 was satisfied stating "based on their design of using a bentonite amended soil and also the natural occurring geology, anywhere

from five feet of a low transmissivity shale . . . way up to 500 feet . . . its belt and suspenders. There is double protection there." Transcript at 53.

42. After reviewing the NOI and reflecting Red Leaf's communications with DWQ, on October 20, 2011 DOGM sent a letter of Conditional Tentative Approval to James Patten of Red Leaf conditioning approval on complying with Condition 1 stating "thirty days (30) prior to ground disturbance, please include in the plan either a groundwater discharge permit (including a permit by rule) from the Division of Water Quality (DWQ), or a letter saying a permit is not required."

43. On October 20, 2011 DOGM published a Notice of Tentative Approval in the Vernal Express and Salt Lake Tribune and sent the Notice to John Blake of SITLA and Matt Cazier of the Uintah County Planning and Zoning Commission.

44. On December 21, 2011, JBR Environmental Consulting, on behalf of Red Leaf, submitted to DOGM the entirety of their Utah Ground Water Discharge Application Permit Red Leaf submitted to DWQ ("Discharge Permit Application").

45. On January 11, 2012 the Division accepted the amended NOI and added the Discharge Permit Application as Appendix S to the NOI.

46. On February 10, 2012 Rob Herbert, P.G. Manager for Utah Division of Water Quality Ground Water Protection Section, requested additional information from Red Leaf to complete DWQ's review of Red Leaf's Ground Water Discharge Permit Application.

CONCLUSIONS OF LAW

47. Utah Code Ann. § 40-6-4(1) states, "The [Board of Oil, Gas and Mining] ("Board") shall be the policy making body for the Division of Oil, Gas and Mining."

48. Utah Code Ann. § 40-6-15 states, "The [Division of Oil, Gas and Mining] shall implement the policies and orders of the board and perform all other duties delegated by the [Board of Oil, Gas and Mining] . . . The person[s] administering the mining program shall have the technical background to efficiently administer that program."

49. The Utah Supreme Court has held that "an administrative agency should be allowed comparatively wide latitude of discretion in performing its responsibilities." Petty v. Utah State Bd. of Regents, 595 P.2d 1299 (Utah 1979). See also, Ricker v. Board of Ed. of Millard County School Dist., 396 P.2d 416 (Utah 1964) (The law does not favor limitations on powers of administrative body but favors giving the body a free hand to function within the sphere of its responsibilities).

50. Utah Admin. Code R647-4-106, Operation Plan, states "The operator shall provide a narrative description referencing maps or drawings as necessary, of the proposed operations including: . . . (8) depth to groundwater, extent of overburden material and geologic setting."

51. Utah Admin. Code R647-4-109, Impact Assessment, states "The operator shall provide a general narrative description identifying potential surface and/or subsurface impacts. This description will include, at a minimum: 1) Projected impacts to surface and groundwater systems; . . . [and] (5) Actions which are proposed to mitigate any of the above references impacts."

52. The "sphere of responsibilities" of Division staff related to applications for a Large Mine Operation is to use their technical subject matter expertise to administer the Board's policy decisions by applying the Board's Large Mining Operations rules, Utah Admin. Code R647-5 et seq., to an application as submitted.

53. The Large Mine Operation ground and surface water rules are broad and do not delineate specific methodology to determine if a rule is met leaving that decision in the discretion of DOGM staff.

54. The Division properly used their expertise, *see* Findings 24, 25, 35, 36, 39,41, to determine that Red Leaf's NOI met the relevant requirements, *see* Findings 33, 34, 37, 38, 40, 42, of R647-4-106.8, Depth to Ground Water, Extend of Overburden Material, and Geologic Setting, and R647-4-109.1, Projected Impacts to Surface and Ground Water.

55. In their testimony, Living Rivers raised several policy concerns outside the scope of this proceeding to determine if Red Leaf met the relevant Large Mine Rules. While not considered at the Informal Conference, their concerns may be addressed by the Division in future discussions of modifying regulatory policy relative to other prospective oil shale/tar sands mining applications.

ORDER

1) The Tentative Conditional Approval approved on October 20, 2011 is now final.

2) Red Leaf Resources must still comply with Condition 1: "Thirty days (30) prior to ground disturbance, please include in the plan either a groundwater discharge permit (including a permit by rule) from the Utah Division of Water Quality (DWQ), or a letter saying a permit is not required."

3) DOGM reserves all enforcement and inspection rights under R647-6 et seq. to monitor the Southwest Mine #1 to ensure ground and surface waters are adequately protected if Red Leaf complies with Condition 1.

RIGHTS OF APPEAL

RIGHTS OF APPEAL

This ORDER may be appealed to the Board of Oil, Gas and Mining in accordance with the procedures set out in R647-5-105(17) and R641-105-100 by filing a written Request for Agency Action with the Board within **ten (10) days** of receipt of the ORDER.

SO DETERMINED AND ORDERED this 9th day of March 2012.

John Baza, Director
Division of Oil, Gas and Mining
Informal Conference Officer